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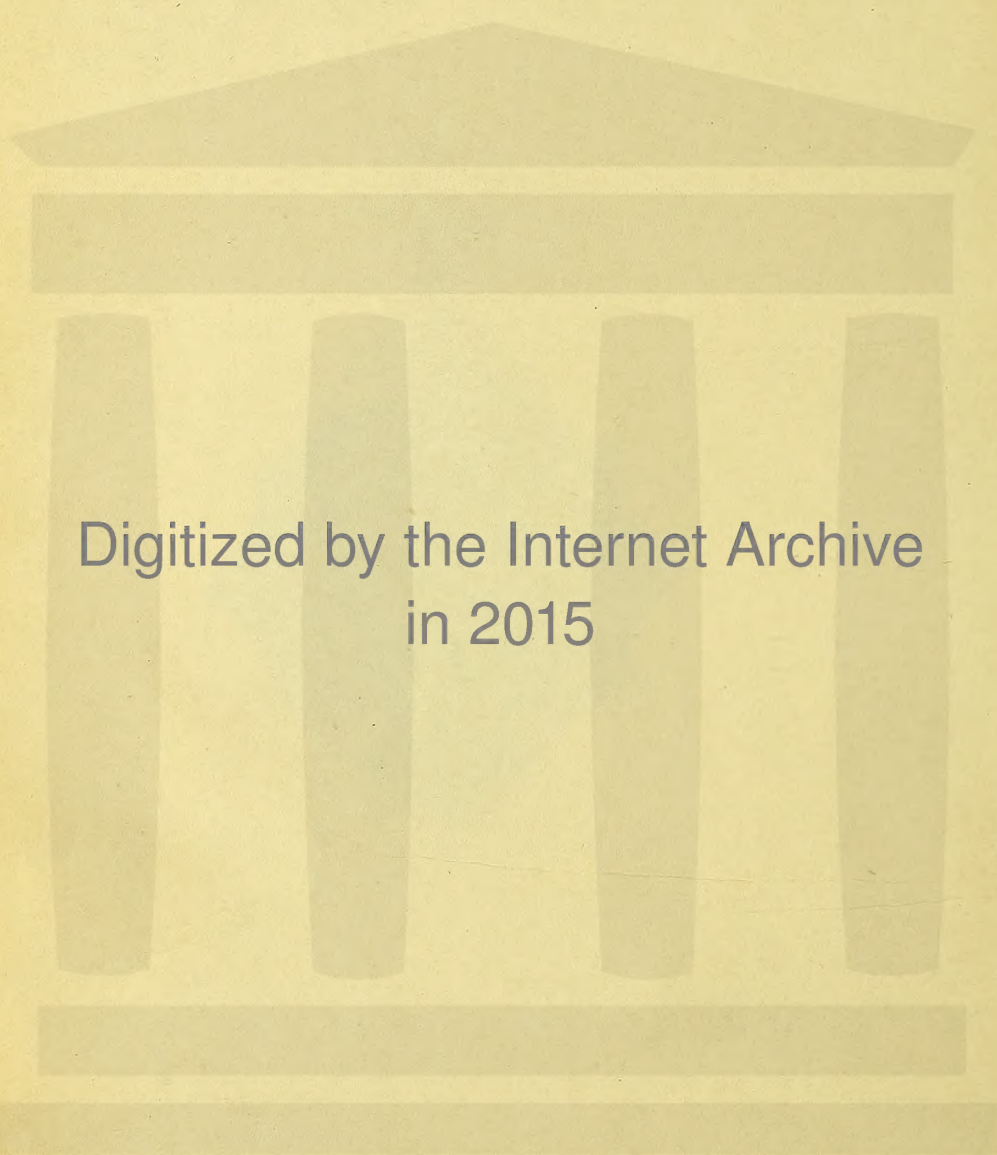
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# FOURTH REPORT

OF THE

GB ROYAL COMMISSION on

Vaccination

APPOINTED TO INQUIRE INTO THE SUBJECT OF

## VACCINATION;

WITH

### MINUTES OF EVIDENCE AND APPENDICES.

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Presented to both Houses of Parliament by Command of Her Majesty.

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VACCINATION COMMISSION

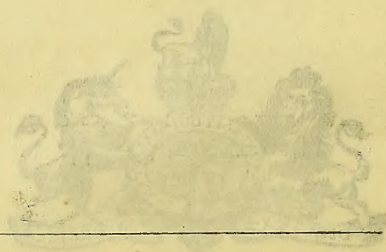
FOURTH REPORT

OF THE

ROYAL COMMISSION

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# ROYAL COMMISSIONS.

## I.

### VICTORIA R.

**Victoria**, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith,

To Our right trusty and well-beloved Councillor, Farrer, Baron Herschell, Our trusty and well-beloved: Sir James Paget, Baronet, Fellow of the Royal College of Surgeons, Sir Charles Dalrymple, Baronet, Sir William Guyer Hunter, Knight Commander of Our Most Distinguished Order of Saint Michael and St. George, Fellow of the Royal College of Physicians, Sir Edwin Henry Galsworthy, Knight, William Scovell Savory, Esquire, President of the Royal College of Surgeons, Charles Bradlaugh, Esquire, John Syer Bristowe, Esquire, Fellow of the Royal College of Physicians, William Job Collins, Esquire, Fellow of the Royal College of Surgeons, John Stratford Dugdale, Esquire, one of Our Counsel learned in the Law, Michael Foster, Esquire, Master of Arts, Professor of Physiology in Our University of Cambridge, Jonathan Hutchinson, Esquire, Fellow of the Royal College of Surgeons, James Allanson Picton, Esquire, Samuel Whitbread, Esquire, and Frederick Meadows White, Esquire, one of Our Counsel learned in the Law, greeting!

**Whereas** We have deemed it expedient that a Commission should forthwith issue to inquire and report as to—

- (1.) The effect of vaccination in reducing the prevalence of, and mortality from, small-pox.
- (2.) What means, other than vaccination, can be used for diminishing the prevalence of small-pox; and how far such means could be relied on in place of vaccination.
- (3.) The objections made to vaccination on the ground of injurious effects alleged to result therefrom; and the nature and extent of any injurious effects which do, in fact, so result.
- (4.) Whether any, and, if so, what means should be adopted for preventing or lessening the ill effects, if any, resulting from vaccination; and whether, and, if so, by what means, vaccination with animal vaccine should be further facilitated as a part of public vaccination.
- (5.) Whether any alterations should be made in the arrangements and proceedings for securing the performance of vaccination, and, in particular, in the provisions of the Vaccination Acts with respect to prosecutions for non-compliance with the Law.

**Now know ye**, that We, reposing great trust and confidence in your knowledge and ability, have authorised and appointed, and do by these presents authorise and appoint, you, the said Farrer, Baron Herschell; Sir James Paget; Sir Charles Dalrymple; Sir William Guyer Hunter; Sir Edwin Henry Galsworthy; William Scovell Savory; Charles Bradlaugh; John Syer Bristowe; William Job Collins; John Stratford Dugdale; Michael Foster; Jonathan Hutchinson; James Allanson Picton; Samuel Whitbread; and Frederick Meadows White; to be Our Commissioners for the purposes of the said inquiry.



And for the better effecting the purposes of this Our Commission We do by these presents give and grant unto you, or any five or more of you, full power to call before you such persons as you shall judge likely to afford you any information upon the subject of this Our Commission; and also to call for, have access to, and examine all such books, documents, registers, and records as may afford you the fullest information on the subject; and to inquire of and concerning the premises by all other lawful ways and means whatsoever.

And We do further by these presents authorise and empower you, or any five or more of you, to visit and personally inspect such places as you may deem expedient for the more effectual carrying out of the purposes aforesaid.

And We do by these presents will and ordain that this Our Commission shall continue in full force and virtue; and that you, Our said Commissioners, or any five or more of you, may, from time to time, proceed in the execution thereof, and of every matter and thing therein contained, although the same be not continued from time to time by adjournment.

And We do further ordain that you, or any five or more of you, have liberty to report your proceedings under this Our Commission from time to time, if you shall judge it expedient so to do.

And Our further Will and Pleasure is that you do with as little delay as possible report to Us, under your hands and seals, or under the hands and seals of any five or more of you, your opinion upon the several matters herein submitted for your consideration.

Given at Our Court at Saint James's the Twenty-ninth day of May one thousand eight hundred and eighty-nine; in the Fifty-second year of Our Reign.

By Her Majesty's Command.

HENRY MATTHEWS.



## II.

## VICTORIA R.

**Victoria**, by the Grace of God, of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith, To Our trusty and well-beloved John Albert Bright, Esquire, greeting !

**Whereas** We did, by Warrant under Our Royal Sign Manual, bearing date the twenty-ninth day of May, One thousand eight hundred and eighty-nine, appoint Our right trusty and well-beloved Councillor, Farrer, Baron Herschell, together with the several gentlemen therein respectively mentioned, or any five or more of them, to be Our Commissioners to inquire and report as to—

- (1.) The effect of vaccination in reducing the prevalence of, and mortality from, small-pox.
- (2.) What means, other than vaccination, can be used for diminishing the prevalence of small-pox; and how far such means could be relied on in place of vaccination.
- (3.) The objections made to vaccination on the ground of injurious effects alleged to result therefrom; and the nature and extent of any injurious effects which do, in fact, so result.
- (4.) Whether any, and, if so, what means should be adopted for preventing or lessening the ill effects, if any, resulting from vaccination; and, whether, and, if so, by what means, vaccination with animal vaccine should be further facilitated as a part of public vaccination.
- (5.) Whether any alterations should be made in the arrangements and proceedings for securing the performance of vaccination, and, in particular, in the provisions of the Vaccination Acts with respect to prosecutions for non-compliance with the Law.

**And whereas** one of Our Commissioners so appointed, namely, Charles Bradlaugh, Esquire, has since deceased :

**Now know Ye** that We, reposing great confidence in you, do by these Presents appoint you, the said John Albert Bright, to be one of Our Commissioners for the purpose aforesaid in the room of the said Charles Bradlaugh, deceased, in addition to and together with the other Commissioners whom We have already appointed.

Given at Our Court at Saint James's the Eighth day of April one thousand eight hundred and ninety-one; in the Fifty-fourth year of Our Reign.

By Her Majesty's Command.

HENRY MATTHEWS.



## II.

## FOURTH REPORT.

TO THE QUEEN'S MOST EXCELLENT MAJESTY.

MAY IT PLEASE YOUR MAJESTY,

WE, the undersigned Commissioners appointed to inquire into the subject of vaccination, desire humbly to submit to Your Majesty a further Report of our proceedings.

Since the 2nd of July 1890 we have held thirty-three meetings and examined fifty-three witnesses, notes of whose evidence, with other information relating thereto, are appended.

All which we humbly submit for Your Majesty's gracious consideration.

(Signed)

HERSCHELL.

JOHN S. DUGDALE.

JAMES PAGET.

M. FOSTER.

CHARLES DALRYMPLE.

JONATHAN HUTCHINSON.

W. GUYER HUNTER.

J. ALLANSON PICTON.

EDWIN H. GALSWORDY.

SAM. WHITBREAD.

WM. S. SAVORY.

FREDERICK MEADOWS WHITE.

JOHN S. BRISTOWE.

JOHN ALBERT BRIGHT.

WILLIAM JOB COLLINS.

BRET INCE,

Secretary.

28th July 1891.

By Her Majesty's Command.

HENRY MATTHEWS.



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# MINUTES OF EVIDENCE

TAKEN BEFORE THE

## ROYAL COMMISSION

ON

## VACCINATION.

At 8, Great George Street, Westminster, S.W.

Forty-second Day.

Wednesday, 9th July 1890.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Mr. CHARLES BRADLAUGH, M.P.  
Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.  
Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. BRET INCE, *Secretary*.

Professor EDGAR MARCH CROOKSHANK, M.B., examined.

10,324. (*Chairman*.) You are Professor of Comparative Pathology and Bacteriology in King's College, London?—Yes.

10,325. And you are also Fellow of that College?—Yes.

10,326. Have you given some attention to the question of vaccination and cognate subjects?—I have, for some years.

10,327. When did you commence specially directing your attention to the question?—I have practically devoted my time entirely during the last six years to pathological researches in relation to communicable diseases, and during the past two or three years more particularly to researches with reference to cow-pox.

10,328. Until then you had paid no attention to this subject beyond that which is ordinarily paid by those studying medicine, I understand?—That is so.

10,329. And the result of your studies has been made public in the work which you published some little time ago?—That is so.

10,330. The first subject to which you desire to direct the attention of the Commission, I understand, has relation to small-pox inoculation?—Yes; I propose to lay before the Commission this map.

10,331. Will you be good enough, before you do that, just to indicate the bearing which you conceive that has upon the subject with which this Commission is directed to deal?—I propose describing the prevalence of small-pox inoculation first of all, and more particularly the effect of its being replaced by cow-pox inoculation.

10,332. What are the points indicated by the map?—I would draw your attention, first of all, to certain localities which are coloured orange; those are the localities in which inoculation has been practised from "time immemorial," and I may say that this subject has just been touched upon in Questions 16, 17, and 18 of the Commission's First Report, and pages 65 and 66 of the Appendix to the Report. The countries which are coloured yellow are the countries in which small-pox inoculation was practised during the past century. (*The map was handed in. See Appendix I., facing page 398*.) With reference to the origin of small-pox inoculation, I propose to dismiss that with a very few words, as not having any important bearing upon the subject before the Commission; but as the question has been already asked, I should like to amplify the answer which has been given, and to point out that inoculation was supposed to have originated in the countries in the neighbourhood of the Caspian Sea, and to have been spread by traders and pilgrims. It was also practised at Constantinople at a very early date, where it was said to have been introduced from Circassia or from the Morea. The Armenian Christians practised inoculation since the memory of man; at Damascus and all along the coast of Syria and Palestine it had long been known. In Turkey in Asia it was said to have been of as ancient a date as the disease itself. It was said to have been also known in Africa from time immemorial; it was so ancient in the kingdoms of Tripoli, Tunis, and Algiers that nobody knew its first rise.

*Prof. E. M. Crookshank, M.B.*

9 July 1890.



Prof. E. M.  
Crookshank,  
M.B.

9 July 1890.

10,333. What is the authority for these statements?—I propose under the next heading to give you the authorities for these statements.

In India we are told that it was a most ancient custom. In France, according to tradition, inoculation had long been practised by the peasants in different parts, but especially Auvergne and Perigord. In Italy, especially at Naples, it had been secretly practised by the people from time immemorial. In Russia it was said to have been employed in some parts of the empire at a very early date. In Great Britain a similar practice had prevailed in Wales and in the Highlands of Scotland. In Pembrokeshire the custom had been carried on from time immemorial.

I now pass on to describe the extension of the practice, and to point out that it was not until the 18th century that we get written accounts of it, and that we can trace the gradual extension of this custom over the civilised world. For instance, De la Motraye saw the operation performed in Circassia in 1711, and published an account in 1723. But Kennedy, a surgeon, was the first to publish an account in England; he referred to the practice in Constantinople, in 1715.

10,334. What was the date of his publication?—1715.

10,335. (*Professor Michael Foster.*) What is the title of his publication?—An “Essay on External Remedies.” In 1717, Woodward communicated a paper by Timoni to the Royal Society, in which he described the practice among the Turks, and in the same volume of the Philosophical Transactions another account was given by Pylarini. In Turkey in Asia, it was described by Dr. Patriek Russell, physician at Aleppo, in 1726. In Africa, Colden described the practice among the negroes in Senegal, and in 1728, Cassem Aga described the custom in Tripoli, Tunis, and Algiers, and Dr. Shaw in 1738, described inoculation in Barbary. In India, Holwell described the manner of inoculating in 1767. In China, D’Entrecolles, in 1718, described the custom of “sowing” the small-pox.

Passing now to Europe, I find that in France in 1717 Dr. Boyer was the first writer who noticed inoculation, and a few years afterwards Dr. de la Coste gave an account of the introduction of inoculation in England. A thesis by Dr. Hecquet and reports of failures in the United States of America brought inoculation into disrepute. In 1752, Dr. Butini brought the subject forward, and two years later, M. de la Condamine read a paper before the Royal Academy of Sciences in Paris. In 1755, it became a recognised practice, for which M. Turgot and Dr. Hosty were chiefly responsible. In 1756, persons of high rank led the fashion, and in 1758, the practice was introduced into most of the large towns in France. In 1760, Gatti practised his simple method. In 1763, there was an outcry and the practice was prohibited, an outbreak of small-pox in Paris being attributed partly to inoculation. In Spain it was introduced about the year 1730, and was extensively practised in 1771. Dr. Gorman introduced the Suttonian system in the year 1772. In Italy, inoculation was introduced by Peverini in Rome in the year 1754. There was opposition to the practice, which was overcome by M. de la Condamine in 1755. In about ten years, the practice was established in nearly all the large towns of Italy. In Germany and Austria, inoculation was first performed in Hanover in 1724 by Mr. Maitland. It was much opposed by Haen, of Vienna, who was replied to by Condamine, Tissot, and others. In the year 1768 Dr. Ingenhousz inoculated some of the Imperial family, and an inoculation hospital was established in Vienna. It was at first discountenanced at Berlin; Meckel had deaths and Dr. Muzell also. (In six cases there were three deaths and three were disfigured). In 1774, Dr. Baylies had a fatal case, and silenced an unfavourable report of it. In 1775, inoculation was encouraged by Royalty, and physicians were summoned from the provinces to be instructed by Dr. Baylies. The children in the orphan houses were utilised for the purpose. In Holland inoculation was introduced in the year 1748 by Dr. Tronchin, but it was not very generally adopted until the year 1746. In Denmark a countess was inoculated in the year 1754, and in 1758 two inoculation houses were established by the King at Copenhagen; and in 1760 a Royal Prince was inoculated. The first trial of inoculation in Sweden was made in 1754; it made rapid progress for Dr. Schultz gave such a favourable report of the practice in London, that several inoculation houses were established. In Switzerland it was first performed in Lausanne (about 1750, I believe) by a lady who inoculated her child and encouraged many to follow her example. In Russia

inoculation was introduced into St. Petersburg and Moscow by Dimsdale in 1768; the Empress was inoculated, and the practice was set going in the empire.

In America, in the year 1721, the Rev. Cotton Mather reprinted the accounts given by Timoni and Pylarini, and sent them to the practitioners in Boston. Dr. Zabdiel Boylston inoculated his child and afterwards many others! There was much opposition, and the “select men” of the town passed a resolution against it. In 1738, in South Carolina, a cargo of slaves was inoculated by Mr. Mowbray. He was followed by Dr. Kirkpatrick and others. Inoculation was extensively practised by a planter of St. Christopher. In 1764 the practice was again resorted to in Boston. In South America it was practised by missionaries in 1728 and 1729.

Now passing to its introduction into England. The profession in England was persuaded to adopt various inoculation by Lady Mary Wortley Montagu. She recommended it in a letter in 1717, and had her own child inoculated in Constantinople in that year by Mr. Maitland, but the method was not openly employed in England until 1721 (except by the peasants). De Castro, writing in 1721, said it had secretly been done in London. In the same year Dr. Harris described the Chinese and Byzantine methods to the College of Physicians. He was the first to mention inoculation by a thread. In April 1721 Lady Mary Wortley Montagu had her daughter inoculated by Maitland.

10,336. (*Chairman.*) Had there been nothing written upon it in England before, although it had from time immemorial prevailed?—Nothing had been written upon the subject.

10,337. (*Professor Michael Foster.*) What do you mean by “time immemorial”? In Wales, if I remember rightly, in a paper published in the Philosophical Transactions, where the doctor refers to inoculation in Wales, he refers to an old woman or an old man who remembered that her or his father or mother was inoculated; it does not go further back than that, I think, and, if so, that is not quite “time immemorial,” is it?—I have used the expression which I find used in the paper by Dr. Williams. Mr. Wright, the surgeon of Haverfordwest says, writing in 1722, “I received yours the 9th instant, and in answer to “it will readily give you all the satisfaction I can “in relation to a very ancient custom in this country, “commonly called buying the small-pox, which, upon a “strict inquiry, since I had your letter, I find to be a “common practice, and of very long standing, being “assured by persons of unquestionable veracity and “of advanced age that they have had the small-pox “communicated to themselves this way when about “16 or 17 years of age.”

10,338. He goes back further than that, because he speaks of an old man or old woman who knew that his or her mother or father was also inoculated, but that is as far back as he goes?—The person to whom you refer, I think, was Margaret Brown; her evidence goes to show that she had “known this way of procuring the small-pox practised from time to time above 50 years.”

10,339. (*Chairman.*) Is there no authority with reference to Wales beyond that?

(*Mr. Bradlaugh.*) He also says, “These, together with “the many other informations I have met with from “almost all parts of the country, confirm me in the “belief of its being a very ancient and frequent practice “among the common people”?—Yes. All the information is contained in those two publications, one by Dr. Perrot Williams and the other by Mr. Wright, a surgeon at Haverfordwest.

10,340. (*Chairman.*) What struck one as a little strange was that if it had been practised from time immemorial in Haverfordwest, it should have only got to the knowledge of people in England from the experience of Lady Mary Wortley Montagu in Constantinople?—She introduced it to the profession in London. I may add that when inoculation was brought before the profession Dr. Munro, of Scotland, also described it as “an old “practice” in the Highlands of Scotland; that is the expression used in his account. The same applies to the Isle of St. Kilda.

10,341. (*Mr. Meadows White.*) To what page of your book are you now referring?—I am referring now to page 27 of my book.

10,342. (*Chairman.*) Have you completed your survey of the introduction of inoculation in the different countries?—Not completely. Although the first opera-



tion was performed in London in 1721, yet Dr. De Castro writes at that date to say that the operation had been secretly performed in London before that.

10,343. (*Professor Michael Foster.*) Where does Dr. De Castro say that?—In “A Dissertation on the ‘Method of Inoculating the Small-pox,’ published in 1721, and referred to at page 34 of my book. He says: ‘I have had it very well attested to me that a certain gentleman of this city had the operation performed upon two of his children this last winter, and that his expectations were fully answered in the event.’ That would be previous to the operation being performed in London by Mr. Maitland.

In 1721, as I have said, Lady Mary Wortley Montagu had her daughter inoculated by Maitland; that was the first time it really was introduced to the profession. Others were inoculated, but people were afraid of the method. On the 9th of August 1721 some criminals were experimented upon, but inoculation made but little progress in London. The practice was taken up in the country by Dr. Nettleton, of Halifax, in Yorkshire. In 1722, or about that date, it was more generally adopted. It was patronised by Royalty. The practice, however, was checked by the death of the Honourable William Spencer and the butler of Lord Bathurst and a Miss Rigby. A strong feeling of opposition to the practice then arose. Clergymen and physicians became ardent anti-inoculators. In 1722 an anonymous pamphlet appeared which described inoculation as the outcome of atheism, avarice, and quackery. It was condemned by the Rev. Mr. Massey and Dr. Wagstaffe, a physician of St. Bartholomew's Hospital. The anti-inoculators were replied to by Crawford, Brady, Williams, and Maitland; and they in turn were answered. Inoculation was severely criticised by Mr. Tanner, a surgeon of St. Thomas's Hospital. It was supported by Dr. Jurin who appealed to statistics. In 1723 it was advocated by persons of rank and the heads of the church. In 1725 it was much resorted to. In 1727–28 it began to decline. In 1731 a pamphlet was published exposing fallacies in the statistics, and pointing out that the variolous infection was spread far and wide. Dr. Warren opposed inoculation. This was followed by a revival of inoculation, and after 1738 it was very generally employed; in 1746 an Inoculation Hospital was established. There was still a strong prejudice against inoculation. Dr. Maddox preached a sermon to overcome this. An anonymous discourse was published by an anti-inoculator in 1751. Dr. Maddox was opposed by the Rev. Theodore De la Faye. Mr. Bolaine and Dr. Kirkpatrick replied. These were again answered by Mr. Some and Mr. Doddridge, two divines who were in favour of the practice. In 1754 Mr. Burgess and Dr. Kirkpatrick published works recommending inoculation. In the same year the Royal children were inoculated, and the Royal College of Physicians pronounced the practice to be highly salutary to the human race. In 1758 it was proposed to restrict the practice to surgeons, and this was opposed by Mr. Cooper, a surgeon. In 1759 Dr. Franklin published an account of inoculation. This was followed by Dr. Heberden, who wrote, “Plain Instructions for Inoculation,” and in 1761 a second edition of Dr. Kirkpatrick's work appeared. In 1764 Dr. Alexander Munro gave an account of inoculation of small-pox in Scotland, and in 1765 Dr. Andrews, of Exeter, maintained its advantages.

We then come to a new epoch in the introduction of inoculation, namely, the introduction of the Suttonian method. In 1765 it had been employed upon “a prodigious number of persons”; from 1764 to 1766 by Sutton alone upon 13,792, and with the aid of his assistants upon 20,000; and before long upon 100,000 cases. Dr. Langton described the method as a gross imposition. Langton and Bromfield were replied to by Giles Watts. The new method was adopted by Dimsdale, and from his works inoculation became much more popular than before. It was also adopted by Jenner and others. Inoculation was rivalled by cow-pox in 1798, and forbidden by Act of Parliament in 1840. I may add that in Scotland Maitland introduced inoculation in 1726, and it was employed in Dumfries in 1733, but not in other parts of North Britain until 1753. In Ireland inoculation was first performed in 1723.

10,344. (*Chairman.*) That concludes your view of the origin, the extension, and prevalence of inoculation?—Yes.

10,345. You have next some remarks to make upon the methods of inoculation and their results?—Yes; this has, I think, an important bearing upon the subject of cow-pox inoculation, and I should like as rapidly as

possible to refer to the various methods employed. First of all, if we go to the country in which it was supposed to have originated, we find, according to the description given by De la Motraye, that the method was to employ three needles fastened together; wounds were made in different parts of the body with the needles, and then some of the matter of the pocks of a person suffering from small-pox was taken and applied to the bleeding wound, and the small-pox, it was said, “generally came out very favourably in five or six days.” Then from Kennedy's description we have some further important details; we are told that the Turks were careful to “take a fresh and kindly ‘pock from some one ill of this distemper, and having ‘made scarifications upon the forehead, wrists, and ‘legs, or extremities, the matter of the pock is laid ‘upon the foresaid incision, being bound on there for ‘eight or ten days together; at the end of which time, ‘the usual symptoms begin to appear, and the ‘distemper comes forward as if naturally taken ill, ‘though in a more kindly manner and not near the ‘number of pocks.” Then Dr. Timoni, also referring to the method used by the Turks, informs us that “the ‘more prudent were very cautious in the use of this ‘practice,” and that the method of the operation was this: “Choice being made of a proper contagion, the ‘matter of the pustules is to be communicated to the ‘person proposed to take the infection . . . For this ‘purpose they make choice of some boy or young ‘lad, of a sound healthy temperament, that is seized ‘with the common small-pox (of the distinct, not ‘flux sort) on the twelfth or thirteenth day from the ‘beginning of his sickness; they, with a needle, prick ‘the tubercles (chiefly those on the shins and hams), ‘and press out the matter coming from them into ‘some convenient vessel of glass, or the like, to receive ‘it.” Then “the operator is to make several little ‘wounds with a needle in one, two, or more places ‘of the skin till some drops of blood follow, and ‘immediately drop out some drops of the matter in ‘the glass, and mix it well with the blood issuing out; ‘one drop of the matter is sufficient for each place ‘prick'd. These punctures are made indifferently in ‘any of the fleshy parts, but succeed best in the ‘muscles of the arm or radius. The needle is to ‘be a 3-edg'd surgeon's needle; it may likewise ‘be performed with a lancet.” In a few days the effect of the operation was observed; and he mentions that sometimes the inoculated small-pox was very like the confluent small-pox, but that “at other times the ‘inoculated pocks are distinct, few, and scattered; com- ‘monly ten or twenty break out; here and there one ‘has but two or three, few have 100. There are some ‘in whom no pustule rises, but in the places where ‘the incision was made, which swell up into purulent ‘tubercles; yet these have never had the small-pox ‘afterwards in their whole lives, tho' they have cohabited ‘with persons having it.” The custom with the Arabs was also described by Lady Mary Wortley Montagu, and her description bears out previous descriptions. Lady Mary Wortley Montagu describes the operation as performed by an old woman, and she also was careful to take “matter of the best sort of small-pox,” and as a result of this operation she says that patients “have very rarely above twenty or thirty in their faces,” and “in eight days' time they are as well as before their ‘illness;” in fact she quotes the French Ambassador as saying that “they take the small-pox here by way of ‘diversion, as they take the waters in other countries.” In Turkey in Asia, Harris gave a description of another method employed by the Turks, namely, that instead of introducing the matter into the wound with a lancet, they made a wound and then laid upon the wound a thread imbued with the variolous pus. And Dr. Russell, also referring to the practice in Turkey in Asia, says that there also they were very careful to make the inoculation “with a needle imbued in variolous matter taken ‘from a favourable kind of pock.” In other parts where it was employed by the Arabs they sometimes inoculated between the thumb and the forefinger.

10,346. Do you draw any distinction between the cases you have hitherto alluded to?—No; I am simply drawing attention to the various methods that were employed.

10,347. Would all these methods come in one category as distinct from something that you are coming to presently?—No, they all come into the same category.

10,348. (*Dr. Collins.*) Were they all pre-Suttonian in method?—Those were all pre-Suttonian in method. Now, in Tripoli, as well as in Algiers, they made the

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incision between the thumb and the forefinger, and the result as given by Cassem Aga was that most of the patients had not above 20 pustules. In India the result was described by Dr. Holwell, and he says that the Brahmins were very careful in the material that they used for inoculation; and it appears that they could control to a certain extent the result which followed; they generally preferred "the outside of the arm, midway between the wrist and the elbow for the males; and the same between the elbow and the shoulder for the females." They were very careful to inoculate with matter from pustules of the preceding year; they never inoculated with fresh matter, or matter from the disease caught in the natural way, however distinct or mild the case of small-pox might be; thus they performed arm-to-arm variolation. In China they powdered the scales of small-pox and introduced a paste into the nose, and the results were said to be severe. The practice, as I have already said, was stated by some to have originated amongst the Greeks, and the old Grecian women were particularly careful in their procedure. Having selected their subjects they made punctures with needles, and were particularly careful in the choice of the ferment, as it was called, and the variolous matter that was used was obtained from "the kindly pustules of a young child" (Crookshank, page 53). In Italy, also, precautions were used; the nurses employed "fluid variolous matter recently taken from a pustule." In Wales, in the account which has been already referred to, they pricked the parts of the arms with needles infected with matter, and according to Mr. Wright's account, those who had been inoculated "parted with the matter contained in the pustules to others, producing the same effects" (page 25 of my book), so that, as far back as we have historical records, arm-to-arm inoculation was practised. In Scotland we find that it had been an old practice of parents whose children had not had small-pox to watch for a child of their neighbours which was "in good mild small-pox" (page 27). Now I will draw your attention to the results in America, where the practice was taken up without these precautions.

10,349. The precautions being, as I understand, selecting favourable cases of small-pox, and carefully selecting the lymph?—Yes, carefully selecting the lymph, and also carefully selecting the subjects for inoculation; especially so by the Greeks. In America, Boylston published the accounts of the process which had been written by Timoni and Pylarini, and carried them into practice; out of 244 cases inoculated by him six died from the inoculation. Several explanations were given for these cases, but it appears elsewhere, from the experience of other countries, that it was the method he adopted, and that he had not grasped the proper method; he recommended inoculation with pus from the ripe pustules of small-pox, a practice which was condemned later on.

10,350. (Professor Michael Foster.) Did not some of the inoculators say that it did not matter whether they took it from the actual small-pox vesicle or from the place of inoculation?—Dimsdale made that remark, but the experience of Sutton, and of Dimsdale himself, and others, went to contradict that.

10,351 I am speaking of those well acquainted with the Suttonian method, Ruston and others?—There were differences of opinion.

10,352. In the description of the Suttonian method, is it not stated that Sutton sometimes took it from the inoculated spot, and sometimes he did not?—That is so. When Sutton himself wrote a description of his system, this was the account that he gave. He acknowledged that he had relied upon the use of crude, fresh matter. His results, were as follows (Crookshank, page 78): "In his experience with concocted matter, the infection was not so rapid; the indications on the arm 'not so favourable; the conglobate glands in the axilla were more liable to suppurate; and the eruptive symptoms were more irregular and ungovernable.' In fact, the patient in all likelihood encountered 'a very copious small-pox, which he would not have had from the use of fresh matter.'"

10,353. Are you not aware that it was very largely disputed among the inoculators of the time as to what was the actual cause of the success of the Suttonian method; that there was by no means unanimity as to what was the actual secret of Sutton's success? Are you, first of all, certain that the whole of Sutton's success was due to his taking, not the matter from the small-pox, but from the inoculated spot?—I hold that Sutton's success was due to the fact that he used early lymph.

10,354. Boylston was wrong because he took too late lymph?—Yes; he says (Crookshank, pages 20-1) you must "take your medicine or pus from the ripe pustules of the small-pox of the distinct kind, either from those in the natural way, or from the inoculated sort, provided the person be otherwise healthy and the matter good. . . . My way of taking it is thus: Take a fine cut, sharp tooth-pick (which will not put the person in any fear, as a lancet will do many), and open the pock on one side, and press the boil, and scoop the matter on your quill, and so on."

10,355. Your view is that the accidents in Boylston's cases were due to Boylston taking too late lymph?—Yes.

10,356. And not to his taking the pus from natural small-pox?—Not to his using natural small-pox.

Precisely similar experiences were met with in England. Maitland, the surgeon who introduced the practice, described the method which was adopted when Lady Mary Wortley Montagu's child was inoculated. The old woman who was going to perform the operation employed a blunt needle, and this Maitland very much condemned. He pointed out that she was using a blunt and rusty needle, and took his scalpel and made an incision and thus introduced the method of inoculation with a scalpel. There is no doubt that the old woman was perfectly right. If we wish successfully to vaccinate a calf, we use a blunt scalpel on purpose. Now, Maitland entirely put aside all the restrictions which had been laid down by these practised inoculators; he made an incision with the scalpel through the true skin, and then he applied variolous pus from ripe pustules. This method was called the "improved," or "reformed," or the "English" operation; but it had soon to be given up because the "reformed" operation was by no means an improvement upon the eastern method; very troublesome ulcers frequently resulted; and Kirkpatrick mentions a young man who suffered so severely from inoculation that amputation of the arm was apprehended.

10,357. (Chairman.) That was not from small-pox but from ulcers resulting from the operation?—Yes, from ulcers resulting from the operation.

10,358. How did it succeed as regards small-pox, did it communicate it more or less severely?—In my book, on page 54, I have stated that there was a favourable eruption in that case.

10,359. Therefore the evil produced was not that it gave a more severe attack of small-pox, but that it produced sores resulting from the operation, independently of small-pox?—Both might follow. I shall refer to accounts in which it is especially mentioned that there was a greater tendency to produce confluent small-pox.

10,360. (Mr. Meadows White.) In your book (page 54) you say that "Kirkpatrick mentions the case of a young gentleman who, with a favourable eruption by inoculation, had nevertheless an arm so terribly ulcerated that amputation was apprehended"?—Yes; that was the result in that case. In some of the cases which are given, in which troublesome ulcers resulted, there are no particulars of the character of the small-pox produced.

10,361. (Professor Michael Foster.) In what way was Maitland's method given up; do you mean that they ceased to make incisions?—Yes, later on. If you will allow me, I will trace the methods from Maitland's time. His want of success was acknowledged universally; it was regarded by the profession that he had been imposed upon by the old women in Turkey. Now I would like to give the Commission the practice of the different inoculators who indicated points that were essential for successful inoculation until they came back to the very method which had been originally employed by the Greeks. Jurin, for instance, in 1729, points out several precautions; he says (Crookshank, page 54), "The utmost caution ought to be used in the choice of proper matter to communicate the infection. It should be taken from a young subject, otherwise perfectly sound and healthful, who has the small-pox in the most favourable manner," and no doubt that had a very good effect, but he went on to say "when the pustules were perfectly matured—"

10,362. That is to say, in the condition in which Boylston took them?—Yes, and the consequence, I take it, was, that the results which he had were exactly what I have described.

10,363. You say Jurin's results were unfavourable?—He made great improvements; but still his results were unfavourable.



10,364. Was not that largely due to his practice of inoculation becoming much more popular?—It was not his results which made inoculation more popular, but because he recommended inoculation.

10,365. Was not it largely due to Jurin, in the year 1729 and onwards, that inoculation became much more common in England?—It was not so much his practice, as that he recommended it, and recommended it upon the ground of statistics; therefore other practitioners became inoculators.

10,366. He himself was an unfavourable example of what he advocated?—Yes; he says (page 55): "The incisions begin to grow sore and painful about the fourth or fifth day, and about the sixth, seventh, or eighth they begin to digest and run with a thick purulent matter, which gradually increases till about the turn of the distemper, during which time the wounds grow wide and deep."

10,367. These were known, I suppose, to the people who followed his recommendations?—Yes, no doubt.

10,368. (*Dr. Collins.*) His statistics were largely based, were they not, upon the practice of other practitioners in the north of England?—Yes, they were; and there is this fallacy in his statistics, that he compares the deaths from natural small-pox with the deaths from selected cases of small-pox inoculation. Critics afterwards pointed out that the natural small-pox attacked anyone; there is no selection of cases when an epidemic occurs.

10,369. (*Mr. Meadows White.*) What he said at the end of that passage (page 56 of your book) was, "The greater the discharge is by the incisions, the more favourable the distemper is found in other respects"?—That is how he probably excused the severe local effects that he had. To continue, as I have said on page 56, "In spite of the precautions which had been recommended by Jurin, inoculation still continued to be followed occasionally by bad results. It was by no means a safe operation, and in order to diminish the risks, Mr. James Burgess published" his book.

10,370. (*Professor Michael Foster.*) From what you said just now I should fancy that sentence ought to run, "in consequence of the recommendations of Jurin"?—I would regard having wounds upon the arm, which may grow wide and deep and lasting for five or six weeks, as an unfavourable result.

10,371. But I mean it as a *non sequitur*. If they followed Jurin's directions they would have had results?—They were liable to have had results; but not when they followed his directions as to the selection of the subjects. His advice was, I take it, both good and bad; it was an improvement upon Maitland's, but still it was not all that was desirable. Now this is what Burgess pointed out; he recommended a special course of preparation, and he recommended (page 57 of my book) that an incision of about an inch long should be made in each arm through the cuticle into the skin, but not through it so as to wound the cellular membrane; that was the improvement he insisted upon. A thread was laid along the whole length of the wound; he then obtained, without those severe local results, a successful operation; the local vesiculation, and the general eruption in the ordinary course. But still, in the history that he gives, we read (page 59) that sometimes severe local results followed: open sores with central sloughs resulted. The slough often extended in breadth and depth, and the wound discharged an ichorous pus, which corroded the adjoining parts, and the inflammation extended down to the elbow. Then the next improvements were made by Dimsdale; he had been in the habit of applying a thread imbued with matter from a ripe pustule. And he points out a modification, a safer method, namely, moistening the lancet with the variolous matter, then with this lancet an incision was made in that part of the arm where issues were usually placed, and the incision moistened with the matter by gently touching it with the infected lancet.

10,372. (*Chairman.*) Was Dimsdale before or after Sutton?—He was a contemporary of Sutton's. He subsequently borrowed Sutton's practice.

10,373. (*Professor Michael Foster.*) Then you think his method was Sutton's?—Not his original method. He at first modified the method of the inoculators of the period.

10,374. (*Chairman.*) At the time you are speaking of now, Dimsdale had not adopted the Suttonian method?

—No, he had not. But he says that he adopted the Suttonian method in 1765. The results that were obtained then were as follows (page 68): "On the fourth or fifth day, upon applying the finger, a hardness is to be felt by the touch. The patient perceives an itching on the part which appears slightly inflamed, and under a kind of vesication is seen a little clear fluid, the part resembling a superficial burn. About the sixth, most commonly some pain and stiffness is felt in the axilla, and this is a very pleasing symptom, as it not only foretells the near approach of the eruptive symptoms, but is a sign of a favourable progress of the disease. Sometimes on the seventh, oftener on the eighth day, symptoms of the eruptive fever appear, such as slight pains in the head and back, succeeded by transient shiverings, and alternate heats, which in a greater or less degree continue till the eruption is perfected. At this time, also, it is usual for the patient to complain of a very disagreeable taste in his mouth, the breath is always fetid, and the smell of it different from what I have ever observed in any case, except in the variolous eruptive fever. The inflammation in the arm, at this time, spreads fast, and upon viewing it with a good glass, the incision, for the most part, appears surrounded with an infinite number of small confluent pustules, which increase in size and extent as the disease advances. On the tenth or eleventh day, a circular or oval efflorescence is usually discovered surrounding the incision." Then he goes on to say (page 69), "In general the complaints in this state are very moderate —"

10,375. There was some eruption apparently?—Yes. As well as the local vesicle, an eruption upon the body appeared. "A few pustules appear, sometimes, equally dispersed; sometimes the inflammations on the arms spread and are surrounded with a few pustules, which gradually advance to maturity." Then he says: "The eruption proceeds kindly, and there is much more difficulty to restrain the patients within due bounds, and to prevent their mixing with the public and spreading the infection (which I always endeavour to prevent), than there was at first to prevail upon them to go abroad." This new method was being practised by the Suttons in the country. The Sutton family had discovered a method of inoculation, and the physicians were very anxious to find out what this method was. Daniel Sutton was very successful. In a very short time there were 100,000 cases inoculated. Dr. Baker published the first account that was given of the Suttonian method. He examined patients who had been inoculated, and obtained the account from them; Sutton, unfortunately, having made a secret of the practice. However, Baker had been able to ascertain what the method was, that the matter for inoculation was taken in the crude state, and that the cuticle on the outer part of the arm was just raised up and the lymph inserted. So early was the lymph taken that it was expressly stated that, in some cases, the moisture taken from the arm before the eruption of the small-pox was used for inoculation. (Crookshank, page 61.)

10,376. (*Professor Michael Foster.*) What does that actually mean, do you think, the fluid appearing at the punctures? As early as the fourth day, I think you say, he took it?—Within four days after the operation had been performed, pointing out how very early he took the lymph.

10,377. The moisture would not be the general exudation, but the fluid of the vesicle which formed at the spot inoculated?—Yes.

10,378. (*Chairman.*) Do I understand your view to be that the peculiarity of Sutton's method was taking the lymph so early?—So very early.

10,379. (*Sir James Paget.*) And from the part?—And from the part which had been inoculated.

10,380. But previously to the appearance of the general eruption?—Yes.

10,381. (*Professor Michael Foster.*) Was not there a very great deal of discussion as to what was the essential part of Sutton's method?—Yes.

10,382. You say that that was the essential part?—I say so, from the statements of the inoculators who followed.

10,383. But at the same time there was a great deal of discussion as to what was the exact cause of Sutton's success, was there not?—Yes; but there was evidence, and most reliable evidence, and the conclusion was that it was taking the virus at that early stage.

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10,384. There were at least four elements in the Suttonian method; there was the oblique mode of puncture which Dimsdale accepted at the same time; there was the taking of crude lymph, that is to say, not from the matured pustule; then there was, thirdly, the cool regimen during the whole time, was there not?—Yes.

10,385. And that was insisted upon always by him?—Yes.

10,386. And that was thought of so great importance, if you remember, that the cool regimen, which was a reminiscence of Sydenham's treatment, was applied to natural small-pox as well as to inoculated small-pox. I suppose Sutton never inoculated without submitting his patients to the cool regimen. And in addition to that there was the preparatory method by treatment with certain drugs?—Yes; but that had been employed by Dimsdale.

10,387. I ask you whether there were not discussions at the time among men such as Chandler, Ruston, and others; and whether there was not considerable divergence of opinion as to whether the success of Sutton's method was due to the taking of crude lymph, to the mode of puncture, to the cool regimen, or to the preparatory treatment by various medicines; and also whether there were not some who maintained to the last that the whole secret was in the preparatory treatment by certain peculiar drugs?—With reference to the first question, unquestionably there was a good deal of discussion, but I have no recollection of their maintaining the latter proposition to the last. I should be glad to have the reference to that. I find, for instance, Dr. Chandler made a minute examination of the medicines, and came to the conclusion that the success did not depend upon the medicinal preparations. Mr. Sutton never made a point of sweating his patient, therefore little efficacy could be attributed to the *punch* he gave them.

10,388. (*Mr. Meadows White.*) At page 77 of your book Dimsdale gives his own conclusion after having tried the various methods?—Dimsdale was the greatest authority at the time, and he says (Crookshank, page 71), "Should it be asked, then, to what particular circumstance the success is owing, I can only answer that, although the whole process may have some share in it, in my opinion it consists chiefly in the method of inoculating with recent fluid matter, and in the management of the patients at the time of eruption." That I should entirely agree with.

10,389. (*Chairman.*) That was the cool regimen?—No doubt, and selecting your patients and taking care of them while they were under treatment would have some effect.

10,390. He refers clearly to the cool regimen, because he goes on to say, "If these conjectures should be true, perhaps we should be found to have improved but little upon the judicious Sydenham's cool method of treating the disease, and the old Greek woman's method of inoculating with fluid matter carried warm in her servant's bosom." He was dealing with the two things, the recent fluid and the cool regimen?—I should not attribute the success to the latter, but I think that the innovation to which Sutton's success was largely due was that he inoculated from arm-to-arm, and selected his lymph.

10,391. (*Professor Michael Foster.*) That is your opinion?—Yes, that is the conclusion I should arrive at, although no doubt the regimen would have some effect; but Dimsdale had used this cool regimen and the preparatory treatment.

10,392. (*Chairman.*) But Dimsdale did not adopt it before he adopted the new system, because he speaks of the particular circumstance to which his success is owing, and he attributes the success of the new system to the cool regimen and the recent fluid matter. He could hardly have done that if he had been in the habit of using the cool regimen before. He would have attributed it to the one thing only, would he not?—He had used those precautions before he took up Sutton's method, because on page 4 you will find that he says so. I have his work here, in which he states his own method previously to adopting Sutton's method.

10,393. (*Mr. Meadows White.*) You say (page 70 of your book) that "He had heard that inoculation of the patients with fluid matter, and exposure to the open air, produced results that were appreciated, and therefore he borrowed the practice." That seems as if, previously to his hearing of the new system, he had used other

methods?—He afterwards objected to their being exposed to the open air.

10,394. (*Chairman.*) What you speak of is the management of the patient at the time of the eruption; that is not the previous regimen and treatment which is referred to on page 65?—If you turn to page 69 you will find the method which Dimsdale used which he afterwards condemned. He says, "Being now arrived at the most interesting period of this distemper, the eruption, a period in which the present practice I am about to recommend differs essentially from the method heretofore in use, and on the right management of which much depends, it will be requisite to give clear and explicit directions on this head, and to advise their being pursued with firmness and moderation. Instead of confining the patient to his bed or his room when the symptoms of the eruptive fever come on, he is directed, as soon as the purging medicine has operated, to keep abroad in the open air—be it ever so cold, as much as he can bear—and to drink cold water if thirsty; always taking care not to stand still but to walk about moderately while abroad."

10,395. When did he write that?

(*Mr. Meadows White.*) The inference from your own words on page 70 seems to show that that was written after he became acquainted with the treatment?—It is difficult to ascertain when Dimsdale took up the practice; he borrowed the practice, and he did not really give those from whom he borrowed the practice the credit of it at first.

10,396. (*Professor Michael Foster.*) You mean the Suttons?—Yes; he borrowed the practice from the Suttons.

10,397. He admitted that he borrowed the practice from the Suttons?—Yes, he published several works on inoculation, and later he acknowledged that he borrowed it from the Suttons (1781).

10,398. Do you know Ruston's paper on inoculation?—Yes.

10,399. At the end of that, after his discussion as to what was the actual value of the Suttonian method, he came to the conclusion, "If I were to give the preference to one thing more than another, it would certainly be to the medicine"?—No doubt.

10,400. I thought you said they were all agreed?—I did not say that.

10,401. I understood your statement to be that the essence of the Suttonian method was to take in crude lymph?—Certainly; and that was generally acknowledged 10 or 15 years after Ruston's paper, when the method was practised by the whole profession, by Dimsdale, Jenner, Lipscomb, and others; but I have been particularly careful to give you the history of the controversy at the time (page 63). When I was speaking of its being generally accepted by the profession that the secret was taking lymph early, I was speaking of the time when the practice had been generally adopted by the profession.

10,402. I thought you were talking now of the Suttonian period, and summing up the Suttonian period by the conclusion that they were all agreed. Ruston was in the Suttonian period?—No; I have pointed out in my book that there was considerable controversy; some said it was due to the purging he gave his patients, and others that it was due to the sweating; there were various opinions.

10,403. (*Chairman.*) Will you tell me what work the earlier extracts from Dimsdale are taken from; those which begin on page 66 of your book and go on through pages 68 and 69?—I think that most of the extracts were from the edition of 1766. There was a seventh edition in 1779, and another work with additional observations published in 1781.

10,404. Was the whole of it written after he had begun to try the new method of inoculation in 1765?—Yes; he refers back to his old practice, and that is where I have had a difficulty in finding out how much credit I ought to give to Dimsdale and how much he had borrowed without acknowledgment.

10,405. Because even in the earlier part of the last paragraph in page 69, which, I take it, had reference to the earlier practice, he says, "The system of purging and the free use of cold air were credited with preventing either alarming symptoms or a large crop of pustules." That must have been written after he knew of the Suttonian system, because those were two



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of the main elements of the Suttonian system, were they not?—Quite so, but I am not quite sure how much refers to the practice by Burgess, because, if you refer to Burgess's work, you will find that he goes very fully (before Sutton and Dimsdale had either of them published works upon the subject) into the method of preparation, the operation and its accidents, and the care of the patient after inoculation.

10,406. (*Mr. Bradlaugh.*) At the bottom of page 56 you mentioned Burgess?—Yes. On pages 56, 57, 58, and 59. Burgess described very fully the care of the patient before and after inoculation.

10,407. But his work was published in 1766, was it not?—Yes, in 1766.

10,408. (*Chairman.*) But Burgess distinctly advocates the reverse process to that of exposing to the air at the time of eruption, does not he; he says the patients were to be carefully kept in bed?—Yes, but I was referring to the medicinal treatment. All I am anxious to point out is that precautions were to a certain extent taken, and that that was one cause of their getting better results than Maitland had. Jurin, for instance, employed precautions although he did not say anything about medicinal treatment, that is in 1729; but Dr. Whittaker, who also described, apart from the operation, what took place, says, bleeding, blistering, and diaphoretics were employed.

10,409. Have you completed all you have to say about the Suttonian method?—Not entirely. I pointed out on page 63 of my book the controversy which took place and the answers which were given. Dr. Baker, for instance, considered that the value of the practice depended on the free use of cold air, but Mr. Chandler said that the great secret of the new system was "the taking of the infected humour in the crude state before it has been, if I may be allowed the expression, ultimately varolated by the succeeding fever."

10,410. When you speak of the success of this new inoculation by Sutton what were the special features of its success?—In using the word "success" I refer to the readiness with which it was taken up. There were a good many objections to Maitland's system and the old system of inoculation. Sometimes they had confluent small-pox and sometimes they had terribly severe local results, and it was a great question whether the danger from inoculation was not greater than the danger of getting natural small-pox.

10,411. But the advantages you speak of are, less severe local effects—a milder attack of the disease?—Yes, the results were so extremely mild that everybody was anxious to be inoculated in this mild way. When, for instance Dimsdale went over to Russia and inoculated the Empress and the Grand Duke, he recommended that inoculation should be performed with a very slight puncture of the lancet wet with fluid of recent variolous matter, and he has given a full account in a work I have before me of the method of inoculation and what took place; and the evidence there certainly, I think, points to the fact that it was the stage at which the lymph was taken before inoculation; but sometimes the result was so mild by taking the lymph at this early stage that the results were as follows (*Crookshank*, page 77): "Sometimes patients under inoculation passed through the illness in a manner that differed materially from natural small-pox." Dimsdale says: "Yet, where the infection appeared to have succeeded satisfactorily on a punctured part of the arm, although no eruption should be discovered in consequence of it, the party will never receive the disease in future." And again, in speaking of the different methods of communicating the infection employed by inoculation, Dimsdale says: "If inoculation be performed by a slight puncture, and with fluid matter, the progress is usually this: After two, three, or four days a small redness of a particular colour may be distinguished, which gradually rises to a pimple, resembling the small-pox in its first appearance; this fills with a pellucid fluid. About the time of the commencement of the eruptive symptoms, the inflammation increases, very often during the fever. Now, when this gradual process is observed to take place, I maintain that, although it be unattended with fever or derangement of health, and not followed by any eruption, the person will during the remainder of his life be secure from receiving the disease. I am emboldened to speak in this positive manner from having made repeated trials to infect such patients again, and in every instance ineffectually." When this method was introduced, in many cases they were able to produce simply a local pustule.

10,412. Were there many such cases; there were some?—In many of Dimsdale's cases, and I think that Sutton's method was milder than the method which Dimsdale employed.

10,413. But Dimsdale speaks of eruptive symptoms as if they were the normal result?—Yes, symptoms, but sometimes there was no eruption of pustules whatever.

10,414. (*Professor Michael Foster.*) Surely he calls particular attention to these cases on account of their interest, that without the eruption there was variola?—Yes.

10,415. There is no reason to conclude from the prominence he gives to the relation, that these were at all common?—I think he had sometimes very much the same result as the inoculators in the east, who aimed at getting 20 or 30 pustules.

10,416. That the limitation of the effect to the vesicle on the spot inoculated was rare?—I do not think it was rare.

10,417. You have no reason to think it was common: may it not be assumed that he gave prominence to such cases on account of their singularity. One has not any reason to conclude from the prominence he gives to such single cases that they were at all common?—I do not think they were very common.

10,418. (*Mr. Meadows White.*) He says (*Crookshank*, page 72): "This continued to the seventh and eighth days, when the eruptive symptoms might, in the common course, be expected. Not one of them, however, had any illness, nor did I expect they would, and in short the experiment turned out wholly ineffectual"?—Yes, but then as a matter of fact he afterwards, I rather gather, considered that even that was effectual.

10,419. (*Professor Michael Foster.*) That was his point—that it was effectual?—Yes.

(*Mr. Meadows White.*) He says, according to you (page 72), that he "was strongly disposed to believe that these patients had passed through small-pox at some earlier period of their lives, but no evidence whatever existed in support of this theory."

10,420. (*Chairman.*) The point is, as regards Dimsdale, that there is nothing to show that these cases of no eruption were anything exceptional—the general thing, however, being eruption more or less?—Yes, nothing exceptional.

10,421. (*Professor Michael Foster.*) There was a strong argument also, was there not, that patients going about with this local mischief gave variola to others by contagion; are you not aware of cases recorded of that? You will find them recorded in the literature as an additional argument for the local mischief being distinctly variola. You will find a case recorded by—I forget the name—in which a man had only the local appearance, and went home and gave variola to his family?—Yes, but that was not my point. I think we have rather wandered from the point I was anxious to lay stress upon, which was this: that the Dimsdale-Suttonian method was so largely successful in the sense that it was taken up by so many people on account of its mildness, and that the average results obtained by Dimsdale and Sutton differed so very markedly from those obtained by previous inoculators, that others were anxious to adopt their practice.

10,422. (*Sir James Paget.*) Do you observe anywhere a record of the proportion of those purely local cases?—There is no evidence as to the actual number of cases in which it had simply a local effect in England, but I believed Gatti, in France, always aimed at getting only a local pustule.

10,423. (*Professor Michael Foster.*) Do you know a work by MM. Desoteux and Valentin on inoculation in which they say, "Sometimes there is no general eruption, but this it is true is extremely rare"?—Is that referring to Gatti's modified method?

10,424. That is a general treatise upon inoculation, in which they speak of the Suttonian method, and give a detailed description of the method. In speaking of its results they say that the cases in which there is no eruption at all are extremely rare, and they go on with Dimsdale to say that they exist, but that nevertheless they are very rare?—I should like before the next meeting of the Commission to refer again to Sutton's own publication, because, although Sutton did not publish his practice at first, but kept it a secret, he afterwards published the "Inoculator, or the Suttonian



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"System of Inoculation," in 1796, if I remember rightly, and I was rather impressed on reading that with the absence of any considerable extent of general eruption.

10,425. (*Chairman.*) You would agree, I suppose, that one would receive any general statement of Sutton's of that sort with a little discount, because it was written for the purpose specially of praising and recommending his own system; therefore one may take it that there may be some tendency to exaggeration in it?—That may possibly be; but he had practically retired then, and even Moore, in his system of inoculation, says that he undoubtedly made a very great improvement in the system, and that all he blamed him for was his unprofessional conduct in having kept the matter to himself.

10,426. (*Professor Michael Foster.*) Was not Chandler a zealous Suttonian?—He advocated the process.

10,427. He was distinctly a Suttonian?—Yes.

10,428. Do you remember his expression, "It is all very well to say that the eruptions are few; I have seen hundreds of pustules"?—Quite so, but we do not know which cases those were. If you remember, Sutton used both methods; he used inoculation with crude fresh matter and concocted matter, and many of those cases to which Chandler refers may have been from the latter.

10,429. Chandler is discussing the pre-Suttonian method by its results, and of those results he says, "It is all very well to say that the eruptions are few. I have seen hundreds of such eruptions," while following himself the Suttonian method?—Quite so.

10,430. (*Sir James Paget.*) May we assume that when there was a general eruption that would be infectious?—Certainly.

10,431. (*Chairman.*) Does that conclude all you have to say upon the Suttonian method?—I think so.

10,432. (*Mr. Meadows White.*) Dimsdale, at pages 77 and 78 of your book, clearly speaks of the eruption as the usual course of the symptoms?—With reference to the opinion of the profession, I would point out, for instance, that Dr. Sanders, in his work, "A Comprehensive View of Small-Pox, Cow-Pox, and Chicken-Pox," written in 1813, in reviewing these various methods, says that "Various methods were devised of preserving the virus, of diminishing its activity, of preparing the constitution for its reception, and of performing the operation; for which some obtained great fame. The best matter is taken from the seventh to the ninth day of the eruption or before the pustule be of a deep yellow colour." It seemed to me to be accepted by the profession that the mild results were due to the virus being taken early.

10,433. (*Sir James Paget.*) Does not he say the "seventh or ninth day"?—"From the seventh to the ninth day of the eruption."

10,434. That is much later than before?—Yes. But there is another important point to be remembered, that it is difficult to know exactly what results Sanders would have recommended, because when Adams used the Suttonian method and carried on arm-to-arm variolation, he reduced the effect entirely to the exhibition of a local pustule; but as far as one can gather, the public did not appreciate the method, they felt that if they paid to be inoculated they were entitled to have a certain amount of eruption.

10,435. That is so, very possibly. Did you get that from the original work of Adams; did he say that there was no eruption?—I have the original work: he says (page 291 of my book), "This is not the only time that we have been interrupted in our attempt to perpetuate a favourable small-pox. For though it was urged to the parents, that before the discovery of cow-pox, the inoculation of the small-pox was sometimes only followed by a pustule at the arm, with the attendant fever; yet the suspicions of many were equal to their prejudices: nothing less than secondary pustules would satisfy them, and some even expressed their doubts, if the eruption was scanty or disappeared early," so that Adams had had sometimes simply the local vesicle, but I take it that the public were not satisfied with that, therefore it was no use trying to perpetuate simply the local vesicle.

10,436. Have you found any statement that Adams could undertake to produce by a series of inoculations from arm to arm, cases which should at last have only the local pustule?—The cases which he has published are to be found on pages 289 and 290 of my work.

10,437. (*Professor Michael Foster.*) Are those all the cases he published?—I think that is a complete abstract, I can easily refer to that point, because I have the book at home, but I propose to deal with this question again later on, and I will lay before you some arm-to-arm "vaccinations" as practised by Guillou, with the details.

10,438. (*Chairman.*) Does that complete the heading "Methods of inoculations and results"?—That completes that heading.

10,439. Then, next, you have something to say with reference to arm-to-arm variolation?—I have heard, and I think I have also read that doubt has been expressed with reference to the statement that arm-to-arm variolation was practised, or that the idea had ever occurred of taking lymph from one inoculated person and conveying it to another. I should like to point out that that was known from very early times. For instance, I have already alluded to an account given of the early inoculation of small-pox in Wales; it is there stated (Crookshank, page 25) that they "parted with the matter contained in the pustules to others, producing the same effects." And again, on page 35, De Castro distinctly advocated it. He says: "There are few or none that make use of the pus extracted from any who have this disease by transplantation, but this being of a milder disposition (I am very inclinable to believe), will be as proper as any other."

10,440. (*Chairman.*) That goes to show that they did not use it?—That was written in 1721, before inoculation had been practised by the profession; but I would point out that he was wrong for it had been done as I showed by the case I gave first of all, but still his statement shows that he recommended it. Then (page 13) the Brahmins were particularly careful to use matter not from the disease caused in the natural way, but from inoculated pustules of the preceding year. On page 75 we have a most striking case in which it was employed, namely, when Dimsdale was anxious to take the variolous matter to Moscow, he inoculated one or two children at St. Petersburg, and took them with him to Moscow so that he could carry on his variolations. Then I propose later on to deal with some arm-to-arm variolations which were practised by Adams and Guillou. I mean those cases I referred to just now.

10,441. The next point to which you wish to direct attention has reference to varieties of small-pox?—This is mere historical evidence which I am anxious to lay before the Commission. I have collected together the evidence as far as I can with regard to natural small-pox, that is to say, small-pox not communicated artificially. Rhazes pointed out the distinguishing characters of the distinct, the coherent, and the confluent kinds. He described the regular and the anomalous small-pox, the benign and the malignant, the hard or horny, and the warty, the slighter and the more severe. Rhazes believed that an attack of mild small-pox was not an absolute security against a malignant attack. John of Gaddesden appears to have laid the foundation of the distinction that was afterwards made of true and spurious small-pox. Francisus de Piedmont in his commentaries on the works of Messua minutely described diversities in the appearances of small-pox. Mercurialis, in a treatise *De Mortis Puerorum*, 1583, mentions the small-pox properly so called, and those termed by his countrymen *Cossi* and *Sturoli*, and alleges that these varieties were all of the genus small-pox, differing from one another chiefly in size. Duncan Liddle, of Aberdeen, Professor of Medicine at Helmstadt in Germany, about the end of the 16th century, in a work *De Febribus*, 1610, pointed out that in addition to small-pox there were other pustules which resembled the blisters produced by boiling water, and that they were termed by some *crystalli*. Sennertus, in lib. 4, cap. 12, gave a full description of the varieties of small-pox, and mentioned the names by which they were known, such as the stone-pox, wind-pox, sheep-pox. Sennertus apparently believed that they all arose from the same contagion. Johnston, in 1652, in *Idea Universae Medicinæ*, described the crystalline variety as large shining vesicles about the size of lupines, which discharged an aqueous fluid; the *schaafs-blattern* (sheep-pox) of the Germans. The tuberculated or stone-pox, he said, were few in number, contained little sanies, and died away quickly. They were attended with little fever. Andreas Buxbaumius, in a thesis published at Leipsic in 1679, stated that "Small-pox had been distinguished by physicians and nurses into several varieties; from their symptoms they had



"been termed *mild* or *malignant*, from the contents of the pustules; *water* and *wind-pox*, from their form pointed or conoidal, and from their occupying a greater portion of the surface of the body, the fluxed or confluent small-pox." Sydenham employed the terms *genuine* and *bastard*, or adulterine small-pox. He expressly states that the small-pox of different years are of different species, the distinct differing from the confluent as much as the confluent from the plague. Pechlinus, in 1691, *Observationes Physico-Medicæ*, states that there were several kinds of small-pox. His own children suffered from a bastard small-pox. Morton, *Treatise upon Small-pox*, 1694, classified them as genuine and spurious, distinct, coherent, benign, and malignant. Among the mild varieties he included chicken-pox, this being the first time that term was used by a medical writer in England. Gideon Harvey in 1696, in a *Treatise on Small-pox and Measles*, also mentions chicken-pox. He also mentions the variety of small-pox known as swine-pox. Etmuller, in his works published in 1697, described the varieties of small-pox under the names conoidal, wind, sheep, and stone-pox. Sometimes they left pits on the skin. Low, in his *Tractatus de Variolis et Morbillis* in 1699, enumerated the different names given to the varieties of small-pox by Latin, Italian, French, and German authors. Isaac, in an *Inaugural Dissertation* printed at Leipsic in 1700, described the sheep, stone, and conoidal-pox as varieties of small-pox. Juncker, in his *Conspectus Medicinæ Theoretico Practicæ*, in 1717, observed that the small-pox are commonly divided into the true and the spurious. He says the latter are such as appear suddenly, and are called by the Germans spitz-pocken (conoidal-pox), or such as are large, quickly fill with a limpid humour, and, after a few days, burst and discharge the liquor which they contain, are much milder than the true small-pox, and are called by the Germans the wind and water pock. Chesneau, in 1719, *Observationes Medicæ*, recognised a spurious sort of small-pox of short duration, without danger, and leaving no marks behind them. Zwingerus, in his *Paedotritia Practica*, in 1722, described an outbreak of varioloid which prevailed epidemically in the town and canton of Basle, in the year 1712. This eruption, which was termed the *wild* small-pox by the common people, was of a nature uncommonly mild, nor did it prove fatal in any instance unless where some disease of a different nature was induced. Dr. Wagstaffe, in his letter to Dr. Freind in 1722, wrote: "There is scarcely, I believe, so great a difference between any two distempers in the world as between the best and worst sort of small-pox in respect to the danger which attends them; nor, perhaps, is there anything that has been more prejudicial and unfortunate to many families than the mistakes which have arisen from their want of knowing this difference. So true is the common observation, that there is one sort in which a nurse cannot kill, and another which even a physician can never cure." Waldschmidt, in an *Inaugural Dissertation* published in 1725, said that the small-pox are divided into the true and the spurious; "that the latter are again divided into the lymphatic, the emphysematic, and the dry (the water, wind, and stone-pox of the Germans)." He mentions likewise, that at the time he wrote there was prevailing in the city an "epidemic of lymphatic or crystalline small-pox which was without danger unless when there was some great error of diet or in the method of cure." Fuller, in his *Ecanthematologia*, 1730, specifies four particulars with respect to small-pox. 1. That they are peculiar to man. 2. That every man is liable to them. 3. That no man (generally speaking) hath them more than once. 4. That they always breed in their own kind. . . . The small-pox keeps precisely in his own family so as to never produce the chicken-pox, measles, or any other distemper whatever, but the true small-pox only."

10,442. I do not follow what he means?—That small-pox breeds true; that it always produces small-pox; and that chicken-pox which always produces chicken-pox is a different disease.

10,443. But he mentions diseases much less akin to small-pox, does he not?—Yes; "measles, or any other distemper whatever." I think there was an idea prevalent amongst physicians in the early part of the 18th century that diseases could pass from one into the other; that they did not breed true.

Of the spurious sorts of small-pox Fuller enumerates four: the Brexias of the Spaniards, the Steinbecten (stone-pox), the swine or hog-pox, and the chrystals or crystal-pox. He also described the chicken-pox.

Dr. Freind, in a letter to Dr. Mead, *De generibus variorum quibusdam*, 1723, fully describes the forms of small-pox, the siliqueose or bladder-pox, and the verrucosé or warty, forms which have usually been regarded as spurious. Dr. Haller, in 1735, wrote: "For several years the small-pox had lain nearly dormant, attacking only few, and in a mild manner," and again: "In the month of March the small-pox which broke out (as generally happens in our country) were of the benign description." Dr. Hillary, in 1735, ridiculed the idea of physicians enumerating so many different varieties of small-pox. He says: "To make more divisions is but more critically trifling than really useful, since all the true kinds of small-pox are essentially of the same nature and proceed from the same cause; and their different appearances and symptoms from the varieties of the then epidemical constitution and season of the year, the different virulency of the miasmata and various dispositions of the persons infected; for from the variety of these all the various symptoms and consequences of this disease may be clearly accounted for. Whereas if physicians were to make as many sorts or kinds of small-pox as they find different symptoms and appearances of them in their patients, it is probable they must make as many kinds of them as the disease makes returns into different towns, if not as many as they have patients, which would be ridiculous trifling." Hoffman, in 1740, said that small-pox considered with respect to the danger attendant upon them, are either malignant or mild, regular or irregular. He added that the true small-pox required to be distinguished from the spurious, which are commonly called wasser-pocken (water-pox) and spitzpocken (conoidal), and which came out with malignant vesicles, filled with a pellucid fluid, and are attendant with fewer symptoms, are less violent, and without danger. Dr. O'Connell, in a work published in Dublin in 1746, in describing the benign and anomalous small-pox which prevailed during the years 1719–20, says that "those who labour under the very mild species of distinct small-pox are seized with a very slight and scarcely perceptible fever, which continues for three or four days, but which entirely disappears upon the breaking out of a very few round pustules, which are very slightly inflamed, and arrive at maturation by the second or third day; at length, being filled with true pus, they become warty and elevated, and dry into scabs, which fall off about the ninth day from the first attack of the disease." Dr. Mead divided small-pox into simple and malignant, and discouraged a greater number of sub-divisions. Plenciz, in 1762, divides small-pox into true and spurious, and gave to the varieties of the latter the same names as in Germany. Heberden, in 1767, pointed out fully how chicken-pox could be separated from the other spurious kinds of small-pox. Gandoger de Foigny, in a *Practical Treatise on Inoculation*, describes a mild form of small-pox, which, in some of its symptoms, resembled this disease, particularly in the rapidity with which it runs its course. On account of this peculiarity, he called it the quick species of small-pox (*courte-espèce*). Van Swieten described three kinds of bastard small-pox. "They are generally preceded by a little slight fever, sometimes only by a little faintness and spontaneous lassitude. Then prominent red pimples break out here and there on the skin, sometimes the first day, and sometimes not till the second or third; and sometimes these pimples immediately harden, dry up, and fall off. These pimples the common people in this country generally call the stone-pox. Sometimes they seem distended with a thin lymph, especially at the point; these, too, however, immediately dry up and fall off. They are called water-pox. Sometimes that lymph is wanting, and nothing appears but empty vesicles, but distended notwithstanding, which likewise soon fall off. These are called wind-pox. These disorders have several other names in different places, but there is no occasion for my giving them. But it is to be noted that all these kinds of spurious small-pox have this one character in common, that they are not attended with the same symptoms that the true kind is in its first stage; that they break out at no stated times, and that their pimples never contain a genuine pus or leave any marks on the skin." Thomson, commenting on these varieties, says, "The three kinds of bastard small-pox which Van Swieten describes, viz., the stone, water, and wind pox, are exactly the same with those which have so frequently been observed during the progress of the late varioloid epidemic among those who had previously passed through

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"small-pox, or who had undergone the process of vaccination, and which are now known under the names of horn, chicken, and wind pox."

10,444. What is the date of Thomson?—The date of Thomson is 1822.

Dr. Sims in 1776 gave an account of a varioloid outbreak in the county of Tyrone. M. Gratioloup described a varioloid epidemic which prevailed at Dax in 1783. (*Journal de Médecine*, Vol. 86). Hufeland in his *Observations upon Natural and Inoculated Small-pox*, published at Leipsig in 1793, remarked that at the commencement of an epidemic the disease is generally exceedingly mild, that during its progress it becomes more malignant, and again towards its termination assumes a mild form. "The varieties of small-pox which he mentions are, first the crystalline or bullose, which run together and form large vesicles, not unlike pemphigus; the second variety he describes as resembling millet seeds which sometimes occur in clusters like herpes, are not dangerous when they fill properly, and generally dry in the form of scales which are frequently renewed; his third variety is the siliqueose, or windy; his fourth, the verrucose, warty or swine-pox; these he says, he never saw by themselves, but frequently mixed with the crystalline; the last variety which he mentions, but which he says he himself never saw, are the bloody small-pox." The conclusion I would venture to draw from this survey of small-pox coincides with the conclusion arrived at by Thomson which was as follows: "That the varioloid eruptions occurring in those who had previously passed through either natural or inoculated small-pox, have had the appellations applied to them which had been given during the first period" [before inoculation was practised] "to spurious or illegitimate small-pox such as wind, water, horn, sheep, swine, and stone-pox, but apparently without the belief that these diseases arise from more than one contagion." I have gone into this history because I thought it might assist the Commission in their conclusions. The next subject which I have to bring before you is the occurrence of small-pox after small-pox.

10,445. What do you say with respect to that?—In this case I have gone into historical evidence from the earliest times, and I am largely indebted to modern works upon small-pox, it being almost impossible to go to the original authorities for many of these accounts; but where I have been able I have done so. The historical evidence as to small-pox after small-pox may be divided into three periods: first of all before the introduction of small-pox inoculation, that is to say, from the tenth century to the year 1720. Rhazes believed that a mild attack was no certain security. Avicenna stated that some persons were attacked with small-pox a second time. Averrhoes was the only Arabian physician who maintained that the same person could suffer an attack only once. John of Gaddesden was of opinion that some persons do sometimes suffer a second time. Ingrassias "found by experience when only a few small-pox pustules have broken out that this distemper is apt, though rarely, to recur a second time, and even in some instances a third time." Eracastorius said persons may suffer a second attack. Fernelius observed that the two opinions which were entertained by some authors concerning small-pox, viz., that every person must pass through them once in the course of life, and that none can have them more than once, were proved by his experience to be erroneous. Amatus Lusitanus, in an account of the Ancona epidemic 1551, said "old people who had formerly been attacked were seized a second time." Fuestus had seen many attacked with small-pox a second time and mentions the case of his own son. Duncan Liddle said "All men have them once, a few twice; but very few a third time." Frabicius said "During the prevalence of an epidemic of small-pox, some people suffered a second time who had had it before." Borel mentioned the general belief that a person can have small-pox only once, and said that he had seen many who had been seized two or three times, and mentioned the case of a woman recovered from seven attacks, but the eighth attack killed her at the age of 118. Deckers, 1673, had seen persons who had had small-pox two or three times. In one case a female had a severe attack, and was much marked; 50 years afterwards she was again infected. Willis, 1661, said sometimes individuals experience a second attack. Fortis, 1679, believed that many suffer two attacks. Sylvius Deleboe, 1679, had often seen individuals labouring under

a second and third attack. Diemerbroeck said that during an epidemic of small-pox at Utrecht there were many persons with copious eruptions who had scarcely recovered when they relapsed and had a second attack. Blancard, 1680, stated that many passed through small-pox two and even three times. Dobrzensky de Nigreponte mentions a case of second attack in a boy. Schweinsbeer reported a case of five attacks in a boy. Stalpert Vander Weil saw a second attack in an infant. Hoyer had often seen individuals pass through a third attack. Regius, 1689, believed that people generally only suffer once from small-pox, but if any of the peccant matter remains the disease may be excited anew. Gideon Harvey, 1696, believed persons could suffer twice or even three times. Ettmuller, 1697, said he had seen many old people die without ever having had the small-pox or measles, and on the contrary, some examples of others who had had them more than once. Hagedorn, 1698, had experienced cases of the same individual suffering a second attack of small-pox, and mentions the case of a lady of title. Behrens had small-pox himself three times "although many people never had this disease at all." Low, 1699, believed that if any of the miasma were left in the body, as sometimes happens, a person may have that disease two or three times. Boerhaave says "that a person who has had the distinct small-pox, may afterwards suffer from the confluent, but that he who had had the confluent small-pox can never be again affected." Then we come to the second period from 1721 to 1799, that is to say, the period during the practice of small-pox inoculation. Thomson, in reference to the same period, says: "In support of their opinion the opposers of inoculation at different times adduced instances of persons who had been inoculated, having been afterwards seized with small-pox. But the advocates of this practice, instead of admitting the possibility of a second occurrence of small-pox in those who had been inoculated, or of adducing, as might easily have been done, instances where this had happened to those who had passed through the disease in the natural way, endeavoured to prove, either that the matter with which the inoculations in these doubtful cases were performed had not been that of genuine small-pox, or that the disease supposed to be small-pox occurring in those who had been inoculated, however striking the resemblance or severe the form was a spurious, not a genuine, small-pox." Kennedy (1715) held that the great objection commonly proposed (against inoculation) is whether or not it hinders the patient from being infected a second time. Maitland, 1722, assured the profession that "there was not an instance known of any one being ever infected who had had any pustules at all, how few soever, raised by inoculation; though, for a farther trial, several had been once and again ingrafted, and others had been confined to the room, and in the same bed, too, with the infected." Dr. Brady said, "Nor can its enemies produce any real instance that those who had it by inoculation have it again, and yet we almost everywhere meet with those who will pretend to give instances of some who had the small-pox twice, even in the natural way." Dr. Nettleton denied the possibility of the recurrence of small-pox. Dr. Jurin, in answer to the question whether inoculation was an effectual security against having an attack in the natural way, and whether the hazard of inoculation was less than that of natural small-pox, wrote, "If either of these questions should by experience be determined in the negative, the practice of inoculation is at an end, for who will run the hazard, be it more or less, of being inoculated unless he believes he shall thereby be secured against having the small-pox in the natural way? And again, why should we choose the present hazard of inoculation rather than the future or distant danger of the natural small-pox unless we are convinced that the former is considerably less than the latter." Surgeon Amyant explained the varioloid eruption in the Hon. Master George Percival, who had been previously inoculated, as chicken-pox. Dr. Hillary, 1735, in discussing whether inoculation was less hazardous than natural small-pox, and whether it was protective, says, "The clearly proving or disproving these must either establish the practice of inoculation on a firm and lasting foundation, or justly explode it for ever after. This can only be done by unprejudiced observations grounded on real facts; but such is the frailty of human nature, that in most cases (even in the greatest concerns of life) men first form to themselves opinions, and then think and agree with too strong prejudices for those opinions; this has been



" too much the case in the affair of inoculation, as is too evident from the writings of several of the gentlemen both for and against it, for some have wrote with so much warmth that they have shown a strong prejudice against it, whilst others have so zealously espoused it, that their writings smell too much of levity, credulity, or an overwhelming bigotry for novelty, certainly the best is to relate matters of fact justly and truly as they are (as I hope some have done), and then leave mankind to judge for themselves." In France there was considerable opposition; in 1756 a lad, two years after inoculation, had small-pox. Thomson, referring to this case, says: "The different opinions formed of the nature of this eruption by the medical practitioners who saw it, and who seemed to have judged of it according to the preconceived notions they entertained with regard to the possibility of the recurrence of small-pox, present so true a picture of what has occurred in similar cases since the introduction of vaccination." M. Gaulard said it was a mild case of small-pox; M. Labat, chicken-pox; others that it was neither, but a crystalline eruption. Gaulard pointed out afterwards the marks which were left. He mentioned other cases. A nephew of the Archbishop of Paris marked by small-pox suffered again unmistakeably. Gaulard was not hostile to inoculation, though he says: "reason dictates and experience actually demonstrates that this process does not infallibly afford protection against a subsequent attack of natural small-pox." M. Labat afterwards signed a certificate in which he said he called it chicken-pox because the physicians themselves gave it no other name, but that it was nevertheless true small-pox, which, in medical language, ought to be called the distinct. M. Condamine, who so strongly advocated inoculation, said: "Even if it were proved that small-pox may return a second time naturally, it does not follow that this will happen after inoculation." Cantwell in 1755 published a number of cases of small-pox both after natural and inoculated small-pox. Condamine in another paper, 1758, said "There is no authenticated case of the return of small-pox in those in whom inoculation has produced its effects; those eruptions which have appeared and which have been reported as cases of secondary small-pox having been cases of chicken-pox." Timoni's daughter died at Constantinople of small-pox though she had been inoculated, and Condamine explained it as *imperfect* variation. The child had 10 pustules after inoculation, but, in his opinion, they were not true small-pox pustules; they were flea-bites. But Condamine acknowledged the case of Mademoiselle Chattellain, inoculated by M. Tenon in 1755 and attacked with small-pox 14 years afterwards. Haen in 1757 wrote that there were "many people who are never attacked with small-pox; many who suffer two attacks." Haen collected a number of cases and on this ground opposed the practice of small-pox inoculation. Caluri, 1760, cited the case of a girl marked by small-pox who was afterwards inoculated. M. Olivier, 1761, mentioned a case of secondary small-pox which occurred in a girl who bore evident marks of a previous attack. M. Lecat, 1761, was of opinion that neither natural nor inoculated small-pox protect infallibly from a second attack. It deprived small-pox of its malignity. He concluded: "Let us be contented with these precious advantages of inoculation; they are the only solid principles of its success, and of its great superiority over the natural small-pox, demonstrated by the most universal and exact calculation. To push our pretensions further is to indulge in chimeras and the wonderful; it is to imitate the enthusiasts for novelty; it is to lend weapons to the enemies of inoculation. Nothing is more pernicious to true religion than superstition and false miracles." Dr. Hensler, 1762, relates the histories of several cases of secondary small-pox during an epidemic at Göttingen. The Parliament of Paris in 1763 called upon the Faculties of Theology and Medicine to report. There were six for and six against. The advocates of inoculation admitted the possibility of the recurrence of small-pox and the danger to the public of infection from persons under inoculation. M. Le Hoc, 1763, in discussing the protection afforded by inoculation, wrote: "An individual who has been inoculated takes the natural pox a year or two afterwards; this attack is endeavoured to be concealed with great care, both on account of the patient himself, of the inoculator, and of the distinguished personages who have formerly submitted themselves to inoculation. The disease is disguised under different names; it is nothing, it is said, but

" a pustulary eruption or the hog-pox, although these pustules are preceded by fever, proceed to suppuration, leave upon the skin the same marks as the small-pox, and run through all the periods of that disease." Monro informs us that his correspondents "almost all agree with me in affirming that they never saw any attacked by true small-pox after they had the true kind, whether communicated by art or nature." Lieutaud, in his "Précis de la Médecine Pratique," 1769, wrote, "Undoubtedly there would be nothing more favourable to the practice of inoculation if it was true, as was said, and as I myself at the time believed, than that it should protect against a second attack of small-pox, but experience has taught us that this precaution has been useless to many, who, lulled into security by inoculation, have been again attacked with this cruel disease, and some of whom even have perished." Baron Dimsdale strongly supported the opinion that true small-pox attacks the same person once only. Hufeland, 1793, believed in the recurrence of small-pox, and was also disposed to think that under certain circumstances the matter of true small-pox might produce a spurious kind of small-pox, which would not protect against a subsequent attack of the disease. Experiments, he says, show that matter which has been taken from the true natural small-pox is rendered in some subjects so mild by inoculation as to produce a pustulation which runs the course of spurious small-pox and which do not protect against an attack of true small-pox. The difference between the true and spurious small-pox, he says, is not to be found in the character or kind of the pustule, or of the fever, nor yet in the marks which are left behind, but in the duration of the disease. To sum up, in the words of Thomson, "Most, if not all, of the advocates for this practice denied the possibility of the secondary occurrence of small-pox, and were anxious to disprove this opinion, conceiving that its admission might be injurious to the cause of inoculation."

10,446. (*Chairman.*) Would it not seem that in that period small-pox after small-pox must have been very rare, from so many medical men as you have alluded to who have directed attention to the subject of small-pox, insisting that there could not be small-pox after small-pox—or do they confine that to small-pox after inoculation?—They refer to both, both to natural small-pox and after inoculation.

10,447. Does not that seem to indicate that it must have been a very rare thing?—It is very difficult to draw any definite conclusion. I am anxious to lay before the Commission the historical evidence exactly as I have collected it, and to leave the Commission to draw their own conclusions. Perhaps the best answer, I can give to your Lordship's question is that in the first period there were some cases reported. In some cases it was, no doubt, the true small-pox, and in other cases, equally beyond doubt, there was confusion with chicken-pox. I may say that cases, undoubtedly cases of small-pox after small-pox, were spoken of afterwards as cases of "varioid" or "spurious" small-pox. Thomson says, "that the varioid eruptions occurring in those who had previously passed through either natural or inoculated small-pox have had the appellations given to them which had been given during the first period to spurious or illegitimate small-pox. That various authors have attempted to prove by their observations and experiments that small-pox virus may undergo such a deterioration in its qualities from heat, dilution, age, &c., as to render infection with it no security against small-pox, either natural or artificial, even though it may have been sufficient to produce febrile action, and a varioid eruption, so like that of true inoculated small-pox as not to be distinguishable from them by the appearances which present themselves." Then we come to the vaccination period, and extracts from Thomson really answer your Lordship's question: "The supporters of vaccination, like those of inoculation, denied that small-pox ever occurred in those on whom this process had been properly performed; but when examples of this occurrence became so numerous and obvious as no longer to admit of doubt, the varioid eruptions occurring in the vaccinated were supposed to be satisfactorily accounted for by the adoption of two hypotheses: the 1st, that as there are several kinds of spurious cow-pox, as well as of spurious small-pox, which do not give that complete security against an attack of small-pox which is obtained by passing through genuine cow-pox, the vaccination in the instances alluded to must have been performed with matter of a spurious

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"sort; the 2nd, that in those cases in which varioloid eruptions succeed to perfect vaccination, the disease is not the small-pox, but an eruption specifically different—the chicken-pox." And again, "It is a singular enough fact in the history of small-pox that the opinion of their occurring only once during life should have been adhered to with so much pertinacity, so long as the practice of inoculation for small-pox was generally followed, that when this practice came to be superseded by vaccination, the belief that small-pox may occur twice or oftener in the same individual should immediately have begun to gain ground, and that it should have been so speedily and generally adopted. We owe, indeed, the confirmation of this belief chiefly to those who have interested themselves in defending the preventive power of vaccination." I will briefly refer to the authorities for these cases during the vaccination period. Jenner referred to several cases. Ring gave four cases of secondary small-pox in individuals whom he had previously inoculated. He had inoculated three children twice, and each time they laboured under fever and eruption; and he mentions several other cases. Cases are mentioned in Volumes V., VI., and VII. of the London Medical and Physical Journal. Messrs. Dunning and Stewart, of Plymouth, gave several cases. One reported by Dr. McGennis was as follows: "A young woman who had formerly passed the small-pox, was some years ago bled with a lancet charged with variolous poison, and this accident was followed in the usual way by the symptoms attending the commencement of small-pox, and, as nearly as can be recollected, by 11 pustules." Dr. Merriam, in "Observations on Vaccine Inoculation" wrote, "The failure of small-pox inoculation, under similar circumstances, in preserving the habit from subsequent infection is universally known and acknowledged; repeated instances of the kind have been published, and further inquiry would bring more to light." Ring published 20 more cases in the London Medical and Physical Journal, Volume 13, 24 in Volume 14, 17 in Volume 15, 7 in Volume 17, and 7 more in Volume 18, and many cases in succeeding volumes. In the report of the National Vaccine Establishment for 1817, the Board refer to two cases of individuals who had had small-pox from inoculation and who caught the second attack from being in houses where mitigated small-pox after vaccination had occurred. Both of them, and one in particular, had the disease more severely than those who had been vaccinated. In the report for 1819 we read "While there are still persons who can be found to question the efficacy of the vaccine, it is proper to remark that, in the course of the year, 15 cases have been reported to the Board, of small-pox attacking the same individual twice, two of which proved fatal." So that we have three periods, the first period in which the evidence was very conflicting as to small-pox after small-pox; the second period, the inoculation period, in which for 80 years it was stoutly denied; and the period, when small-pox inoculation was succeeded by cow-pox inoculation, and then we get evidence of facts which had been denied for 80 years, namely, that small-pox could take place after small-pox inoculation.

10,448. Do you mean that in the second period it was universally denied; I think I caught an allusion to one authority who had asserted it?—This is Thomson's summing up. He says, "It is a singular enough fact in the history of small-pox that the opinion of their occurring only once during life should have been adhered to with so much pertinacity, so long as the practice of inoculation for small-pox was generally followed."

10,449. I suppose that would mean "generally adhered to" by the profession?—It is difficult to know exactly the opinion of the profession as a whole, because those who wrote upon the subject were the inoculators, and the inoculators, of course, stoutly denied it.

10,450. But what strikes me as odd is that they should not have known cases quite apart from inoculated cases, of small-pox after naturally contracted small-pox if, as one may suppose, there were such cases?—In this period they had a great tendency to speak of those cases as chicken-pox, because it would have been used as an argument against inoculation.

10,450a. Do you mean that it would have been said that, having small-pox naturally even does not prevent small-pox, and therefore inoculation will not?—Yes.

10,451. (Dr. Bristowe.) But even in Thomson's time it was generally believed that small-pox was a protective against itself?—Yes.

10,452. Although he says the other view was maintained?—Yes.

10,453. That was the view during the whole of this period, although certain persons may have varied the opinion slightly; yet the general opinion was that small-pox was a protective against itself?—The protection is a question of degree. In the inoculation period in all the works you can refer to on the subject, you find the opinion, as Thomson says, adhered to with much pertinacity, that small-pox cannot occur after small-pox; and then when you come to the next period, you come to a period when such cases are very readily admitted.

10,454. (Chairman.) Do you suggest that there had been any change in the fact, or merely a change of opinion?—A change of opinion only.

10,455. You do not suggest that there was any difference in point of fact between the early and late period?—No.

10,456. (Sir James Paget.) Thomson's judgment appears to be that small-pox can occur a second time after either natural small-pox or after inoculated small-pox?—Yes.

10,457. That is what is the general opinion now, is it not?—Yes; but in the inoculation period the balance of opinion, judging from the history written at the time, was in the opposite direction, the object I think being rather to defend inoculation than as a matter of fact.

10,458. Still now, as a matter of fact, it is the opinion that a second attack of small-pox can occur after an attack of either natural or inoculated small-pox?—Yes. I take it that in the second period of 80 years the balance of opinion on the part of the profession was wrong.

10,459. (Chairman.) Is it quite clear that they apply this immunity in their writings to the case of small-pox after natural small-pox—that they may not have been only speaking by their experience of inoculated small-pox?—They generally distinguish between their experience of natural and inoculated small-pox, because one writer said that even if it was clearly shown that small-pox could occur after natural small-pox, that was no argument that it could occur after inoculated small-pox.

10,460. Is it quite certain in their writings, when they are speaking of the impossibility of small-pox after small-pox, they are not speaking of experience derived from inoculated small-pox and not of the question apart from that?—I have endeavoured in these accounts to distinguish these cases. In the first period, of course, before there was any inoculation, it must have been small-pox after natural small-pox.

10,461. Only it struck me that in the first period the belief that small-pox could not be followed by small-pox did not seem to be so universally held as in the second period?—Yes.

10,462. That seemed to go to the point, that in the second period those speaking of small-pox following small-pox were speaking of small-pox following natural as well as inoculated small-pox, because otherwise it is difficult to understand how they should have departed from their earlier opinion in that direction?—The inoculators looked upon all those cases which had been placed on record previously to the inoculation period, as cases of spurious small-pox.

10,463. (Dr. Collins.) I think Jenner, in one of his works, states that he had heard of a number of cases of small-pox after small-pox?—Yes, I think he mentions the number 3,000, but I cannot give you the reference.

10,464. (Chairman.) Does that conclude what you have to say upon that point?—Yes.

10,465. The next subject you wish to deal with is the protection afforded by inoculation?—I would point out that there is no doubt in my mind from an historical survey, that small-pox does protect against small-pox; that one attack does afford immunity. I think it is the only way in which I can harmonise all the facts which have been stated, and the opinions which have been given, to conclude that as a rule one attack of small-pox does protect against another attack of small-pox; but there were exceptions to the rule, and I think, too, from the evidence which I have given, it appears that a person who has suffered a natural attack of small-pox may certainly suffer if exposed to very virulent



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small-pox. I think the protection is real, that it does exist, but that there are also a number of exceptions for which one must make allowance. Then I would look upon inoculation in very much the same light: if inoculation produces a genuine attack of small-pox it would be protective in just the same way as a natural attack; but the number of cases during the third period which were adduced as evidences of small-pox after small-pox were a number of cases occurring in that period of inoculation when they used a very modified form. I think the evidence as to the question of protection then is a question of the activity of the virus. I think if you inoculate a person that protection will be afforded, but that if you weaken the virus too much you may over-step, so to speak, the limit at which it will give any protection. You may inoculate small-pox and the result be so slight that it is not a security against small-pox infection.

10,466. Do you suggest that that was most likely to have been the case with the Suttonian method in those cases which were capable of producing the least effect?—I think in many cases that would have been the explanation.

10,467. (*Dr. Bristowe.*) Is that your belief, or have you any proof of it?—I take it to harmonise with the number of cases which are recorded of small-pox after small-pox. I have given a certain number of cases of small-pox after inoculated small-pox during the Dimsdale-Suttonian period.

10,468. The subject is a very interesting one, but I should like to know whether you have any clear proof of the suggestions you are laying before us?—I have pointed out that in the second inoculation period, the period during small-pox inoculation, it was accepted with considerable tenacity that small-pox could not occur after small-pox, and then during the third period, that is to say, during the vaccination period, a great number of cases were collected together.

10,469. (*Chairman.*) But just as in the first period inoculators would be found to say that nothing which occurred after inoculation could be small-pox, so in the later period when it was vaccinators against inoculators, would not the vaccinators tend to say that everything that happened after inoculation was small-pox?—Quite so; but I have just given the general historical evidence without drawing too strict a conclusion.

10,470. You admit that in the later cases, as well as in the former, you would require to use some precaution before adopting the view that all that was stated to be small-pox was so?—That is so, but it is difficult to eliminate the evidence altogether; I have given cases reported by Jenner and by Ring; I cannot say whether they are fabricated or not.

10,471. But still, without being fabricated, it would depend upon the accuracy of the observation whether the second attack was small-pox or not, would it not?—I should think it would be very difficult to eliminate the evidence of a man like Ring. They would have been well acquainted with small-pox, I take it, in those days.

10,472. But even last year I understand that there were a considerable number of patients sent to the Metropolitan Asylums Board's hospitals which were not really cases of small-pox?—Yes, but I should say that the practitioners of this day have less opportunity of knowing what small-pox is than the practitioners of that day.

10,473. (*Professor Michael Foster.*) Are all those cases you have given cases in which there was the slightest effect following upon the inoculation?—Jenner himself used Sutton's method, and he gives the cases of small-pox occurring in his experience. Ring and Dunning do the same.

10,474. Your argument is that there were more cases amongst the Suttonian cases than others; not that in the Suttonian period the cases in which a second attack occurred, were the cases in which there had been the smallest eruption?—Those are cases which were given when the Suttonian method was adopted by the profession, but I have no evidence as to the amount of eruption in those particular cases.

10,475. (*Dr. Collins.*) You have told the Commission just now that there was a popular opinion, that if the eruption did not come out fully, the protection was not so great?—There was a popular opinion to that effect.

10,476. (*Chairman.*) In the third period you told the Commission there was a reason for somewhat indus-

triously investigating the question as to the occurrence of a second attack of small-pox after inoculation; therefore the facts were collected more industriously than they were in the period when nobody had any interest in collecting facts. For instance, the fact might have occurred, but unless it occurred within the knowledge of some one who was opposing inoculation at the time, there would have been no reason for taking a special note of it?—I do not think there is any doubt that if you inoculate small-pox, and produce small-pox, that will be protective; but, in my opinion, if the result is reduced, as in Gatti's cases, to the merely local exhibition of a pustule, and nothing more, the protecting limit is overstepped. Dimsdale held the view that even if there was no fever or eruption still there would be protection, but, from studying the law of viruses, I hold that there would be liability to a subsequent attack of small-pox.

10,477. Have you any facts to support the view that the number of attacks of small-pox after the Suttonian inoculation was greater than after the earlier form of inoculation?—I do not think that we can draw any conclusions except from general reading; we come to the vaccination period and then we suddenly get an enormous number of cases acknowledged as cases of small-pox after small-pox, and on going through those cases I find that many are cases inoculated during this period of mild inoculation. I do not wish to press any conclusion whatever—simply to lay the statement before you.

10,478. (*Sir James Paget.*) Is there any statement even by his opponents that small-pox occurred after Sutton's own inoculation?—I do not know that he had any very active opponents. If vaccination had been introduced then, and there had been a controversy, I have no doubt there would have been such statements.

10,479. Many of the inoculators were alive during the vaccination period?—Yes, quite so; and if I remember rightly there were individual Suttonian cases mentioned; but I would not attach too much importance to individual cases.

10,480. I understand your opinion to be that inoculation only followed by a local pustule or by a very scanty general eruption could not be relied upon as a protection?—I think it is a question of degree. In an extremely mild form I should question the protection.

10,481. (*Professor Michael Foster.*) But you base that opinion, not upon any facts, but upon what you call the law of viruses?—Yes, coupled with evidence derived from historical accounts.

10,482. (*Mr. Bradlaugh.*) Your remark upon the law of viruses, would be the result of your observation of the facts recorded, either historically or otherwise?—Yes.

10,483. (*Dr. Collins.*) Is there not contemporary evidence, as to the amount of protection relatively afforded by mild and severe protective inoculation?—Undoubtedly. Not very long ago, I discussed the question with Pasteur himself, and he pointed out that in rabies for instance, a mild virus would not be sufficient to protect an individual against the most virulent virus.

10,484. (*Professor Michael Foster.*) That is a different question; a mild dose of virus, and a mild attack of small-pox are not comparable?—I am speaking of inoculated small-pox.

10,485. But what is your proof that it is a question of doses?—It is not a question of doses, but of the intensity of the virus.

10,486. (*Chairman.*) A mild dose of rabies does not produce rabies, does it?—Yes, certainly it does; it produces the most modified form of rabies, and you must increase your inoculations of rabid virus until you arrive at the most intensive form that you can bear.

10,487. (*Sir James Paget.*) But what evidence of rabies is manifested after Pasteur inoculated?—I take it that the mildest cord which he first inoculates, the mildest series with which he starts, is the mildest form of rabies; that is what I have always understood from himself.

10,488. Is there any comparison between the rabies that manifests itself from this operation and of the small-pox which manifests itself in pustules?—If there were no comparison, my observations would be of no value.

10,489. In one case you discern no external effect, in the other you discern a pustule of a distinctly specific character?—I think it is a question of intensity of the virus. I am specially referring, as I said just now, to



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Gatti's cases, when there was only a local inflammation without pustules.

10,490. Is there any evidence that small-pox occurred without any pustule?—Some small-pox inoculators maintained that such results were protective, but it is very difficult to get evidence upon that subject.

10,491. (*Chairman.*) Does that conclude what you have to say under the heading of "Protection afforded by inoculation"?—Yes.

10,492. In the next place, I think, you wish to speak of the disadvantages of inoculation?—If I may be allowed to refer back for a moment I wish to say that I think small-pox inoculation was undoubtedly a genuine process. It is the only way in which I can harmonise the general evidence; there were a fair number of exceptions, and the number of exceptions seems to have increased with the most modified method. I feel sure that if you were inoculated with variola and had merely a little local exhibition on the arm, or a single pustule, you would be more liable to a second attack of small-pox if exposed to malignant small-pox than if you had had, following upon your inoculation, a fairly copious eruption. I want to insist that there is no doubt in my mind as to the protection afforded by inoculation, but there was one great objection to it: there were certain objections such as that in the early days they did not understand the niceties which have to be observed, and so they sometimes produced confluent small-pox, and they sometimes produced severe wounds locally; but the great danger of inoculation was that while it protected the individual, it endangered the whole community, and the next evidence that I would like to bring before the Commission is the evidence of small-pox being spread by inoculation. I have touched upon this in my book, but I should like very considerably to amplify that account, because I think it stands in very important relation to the discussion. On page 112 I have given an instance of this danger. During the last century, small-pox in the Island of Purbeck had only been known to occur twice in 40 years. Once it had been introduced by inoculation. On page 144 you have an instance given of a man being inoculated by small-pox. "The disease took place: a great many small pocks came out, and he communicated the infection to his father, who died of it." Then (here no doubt we must make allowances for prejudices), on page 227, Jenner writes a letter (although he had been an advocate of small-pox inoculation himself), "to give a check to the licentious manner in which small-pox inoculation is, at this time, conducted in the metropolis." He says, "I instanced the mortality it occasioned in language as forcible as I could utter, and showed him" (the prime minister) "clearly that it was the great source from which this pest was disseminated through the country, as well as through the town." And again in writing another letter (page 242), Jenner says, he is "hurt to think the small-pox again rages. That must be the case, till inoculation is conducted in a different way, if conducted at all." But perhaps the most striking evidence is the perfectly unbiassed evidence given by Haygarth. Haygarth wrote towards the end of the last century: "The most serious and solid objection that has been advanced against inoculation is deduced from a comparison of the Bills of Mortality for a series of years in various places. They show that a larger proportion of inhabitants has died of the small-pox in towns where it is practised than in the same before it was known or in others where it is prohibited. Thus in London, Geneva, and other towns, in different situations and circumstances, the mortality of this distemper has increased since the introduction of inoculation. In this part of England and Wales I am fully persuaded from long and attentive observation that the proportional deaths by the small-pox have not been diminished but augmented by the partial adoption of this practice."

10,493. Have you observed that in London in ten years before the introduction of inoculation, that is to say from 1710 to 1720, there was a very decided increase of small-pox; that the increase of small-pox which no doubt was manifested in London in the 17th century as compared with the beginning of this century, began in the decennium before inoculation was introduced?—Yes, but I have some other statistics.

10,494. Would not that tend to show that there was some cause at work, whatever it was, tending to an increase of small-pox prior to the introduction of inoculation?—Yes.

10,495. How far that was operating in the latter period, or how far inoculation was the cause, would not appear merely from the London statistics comparing the latter period with the earlier period?—I would point out that these statistics of the last century are difficult to examine, and I think that in this case the individual experience of authorities is of very great value.

10,496. But what you have just read to the Commission was Dr. Haygarth's deduction from certain statistics, and amongst others a deduction from the statistics of London mortality, that would have been of value if there had been an increase and if that increase had commenced prior to the introduction of inoculation?—Certainly; but I think the most important part of his letter is that from his long and attentive observation in his own neighbourhood he had observed that the proportion of deaths by small-pox had not been diminished by inoculation, but had been increased. Dr. Adams in his "Observations on Morbid Poisons" also offers as the only argument of any weight against permitting small-pox inoculation that the number of deaths has increased since the introduction of the practice.

10,497. (*Professor Michael Foster.*) Are you aware of Dr. Guy's examination of the statistics of London on that point?—I am not aware of it.

10,498. That he went into the statistics and found that on the contrary the mortality was lessened by inoculation rather than increased?—I would rather confine myself to—

10,499. But Dr. Haygarth is forming an opinion upon London on the same facts as were open to Dr. Guy?—I think that with regard to the conclusions from those statistics I should have to go very fully into all sorts of questions affecting those conclusions before I could throw overboard all the evidence in contemporary literature.

10,500. (*Chairman.*) Was Haygarth writing as a disbeliever in the advantages of inoculation?—Not at all; he advocated it.

10,501. But he was advocating some plan in substitution for it, was he not?—I propose to go fully into what Dr. Haygarth advocated. Although he was advocating that inoculation should be general his evidence as to small-pox being spread by partial inoculation is singularly free from any prejudice.

10,502. (*Professor Michael Foster.*) There are two things—the spread of the small-pox and the mortality from it. You may spread small-pox by inoculating it upon a very large number, but if only a few of those die there will not be a very large mortality?—I am speaking of the spreading of small-pox from the inoculated cases. If you will allow me I will read a passage from Dimdale, he says: "Though the loss under inoculation is very inconsiderable, almost the whole of those that are inoculated recovering, yet, by spreading the disease, a great proportion take it in the natural way: more lives are now lost in London than before inoculation commenced, and the community at large sustains a greater loss: the practice, therefore, is more detrimental than beneficial to society. In the last four years preceding 1776, the London Bills, from small-pox, arose at a medium to 2,544: this increase is truly alarming. The disease, by general inoculation throughout London, spreads by visitors, strangers, servants, washerwomen, doctors, and inoculators; by means of hackney-coaches, in which the sick are sent out to take the air, or by sound persons approaching them in the streets. The poor in London are miserably lodged; their habitations are in close alleys, courts, lanes, and old dirty houses: they are often in want of necessaries, even of bedding. The fathers and mothers are employed constantly in laborious occupations abroad, and cannot attend the inoculated sick; should they neglect their occupations, food and necessaries would be deficient, and the medicines and diet ordered by the physicians, would not be regularly complied with. The air in their houses is impure; they have neither areas, gardens, nor carriages for the convenience of ventilation and taking fresh air. Sailors and seafaring people, many of whose lodgings are miserable in the little houses bordering on the river, would be liable to catch the distemper, and either to fall sick there without friends or assistants, or perhaps being infected on shore to carry it to sea in their contaminated clothes, and afterwards falling sick without care or attendance might spread the disease in foreign climates. Country



"people coming to town for markets, visits, or pleasure, would be all subject to the danger of infection."

(*Professor Michael Foster.*) The essential part of that is the statistical fact which he draws from the Bills of Mortality that the number of deaths from small-pox has been increased by inoculation, whereas a careful examination of the same thing by Dr. Guy leads to the contrary result—the basis of that is the statistical fact; the other, the practical account given by the nurses, could be supplied by anybody.

10,503. (*Chairman.*) Would not the period between 1730 and 1740 be likely to be a period of greater inoculation than the period from 1720 to 1730?—Probably it would.

10,504. Yet apparently the small-pox mortality was smaller during the second decennium than the earlier?—Does that, may I ask, refer only to London.

10,505. Only to London?—I should like to go fully into that question, because inoculation was not adopted very readily in London; it was taken up more in the provinces.

10,506. But the difficulty is that in the provinces we have no similar mortality statistics?—That is so.

10,507. (*Dr. Collins.*) I suppose inoculation would have been more practised from 1770 to 1790 in London than in any of the earlier decades, would it not?—Certainly it would between 1789 and 1790. Then I should like also to read this statement. This may be open to the objection that it is a prejudiced account: it is the report of the National Vaccine Board published in May 1818. I quote it from *Monro's Book*, page 18. "As this iniquitous conduct" (the practice of inoculation) "prevails much in London, an epidemic small-pox was last year excited among those who were not secured by vaccination; for it appears by the Bills of Mortality, that 1,051 persons died of this disease; a number which, according to a probable calculation, included only two-thirds of those who actually fell victims to the small-pox in the capital. Complaints of the same injurious practices have been sent to the Board from various parts of England, and applications made for means of putting a stop to them. In answer to these applications, the Board have transmitted a statement of the legal decisions which have taken place in those criminal prosecutions instituted by their direction, in which the solemn opinions of the learned judges of the Court of King's Bench were pronounced upon this subject. From the above facts, however, it is but too evident that, notwithstanding these decisions, the existing laws are insufficient to prevent the propagating of a destructive pestilence throughout the land, by those who, from interested or mistaken motives, are thus inclined to disseminate a loathsome and mortal disease." That report is signed by Dr. Latham, President of the Royal College of Physicians.

10,508. (*Chairman.*) I suppose it has never been disputed that from an inoculated person small-pox might be conveyed to others?—That has never been disputed.

10,509. It only amounts to this, that by inoculation small-pox is conveyed, and that now there is a better system of vaccination, by which you may get the results without the same danger?—Having made a statement upon the advantages of inoculation, I am now pointing out the disadvantages of inoculation. I insist upon the danger, for instance, of a person coming up to London, and going back inoculated to the country, and spreading the infection of small-pox in the country.

10,510. That nobody would dispute?—With reference to its not being disputed, I may say that it came quite as a surprise to Maitland. Maitland, who first introduced inoculation to this country, held that inoculated small-pox was not infectious.

10,511. (*Professor Michael Foster.*) Where does he state that, in his book?—Yes, that he had a case in which he inoculated a child, and the nurse and several others got small-pox, he was very much surprised; in fact, he says so himself (if I remember rightly) in his work published in 1722. He says, (*Crookshank* page 37), he inoculated Mary Batt, two years old, the daughter of a Quaker. This child having only 20 pustules soon recovered. "But what happened afterwards" (says Maitland) "was, I must own, not a little surprising to me, not having seen or observed anything like it before. The case was in short this: Six of Mr. Batt's domestic servants, who all in turn were wont to hug and caress this child whilst under the operation, and whilst the pustules were out upon her,

"never suspecting them to be catching (nor indeed did I), were all seized at once with the right natural small-pox of several and very different kinds."

10,512. (*Chairman.*) Is there anything further under the heading of "Disadvantages of inoculation" that you wish to lay before the Commission?—There is still further evidence with reference to the spreading of small-pox by inoculation not only in this country but in others. This is a statement the reference to which I could not recall to mind when your Lordship was referring to the number of years previous to the inoculation period. I give this entirely for what it is worth. De Haen (*Sanders*, pages 80–1) says "The promoters of inoculation were obliged to allow that the number of deaths from small-pox was much increased after its introduction. Taking the 22 years immediately preceding the year 1755, which were famous for inoculation, it appears that 43,975 died of small-pox in London; but during the same period immediately preceding the commencement of inoculation in England 36,530 died, a difference of 7,445 against the practice, and in another place he says: 'The deaths from small-pox in England during the first 38 years after the introduction of inoculation, exceeded those for the same space of time previous to it by one-fourth.'"

10,513. (*Professor Michael Foster.*) That is small-pox "in England"?—Yes.

10,514. How does he get that?—I have not been able to go into that.

10,515. What is the worth of the evidence of a man who speaks of the total deaths in England at that time?—I give it for what it is worth.

10,516. (*Dr. Collins.*) They are given in Sir John Simon's Paper?—They are the same.

10,517. (*Chairman.*) What do you say is about the fair time to take as the dividing time between the pre and post inoculation periods, when it was sufficiently the practice to produce an appreciable effect; that is to say, in London?—I do not think it depends entirely upon the amount of inoculation actually being done, because if there were only half-a-dozen people inoculated and distributed in different parts of England they would all be infective centres, and might do as much harm as a thousand people being inoculated.

10,518. Not so much surely; they might do a considerable amount, out of proportion to their number, but it would depend upon the proportion in which they came into contact with people?—It depends entirely upon the opportunities for infection afforded to the non-protected.

10,519. Taking a number of people capable of distributing small-pox naturally in a thousand centres, to add half-a-dozen to them would not make a great difference?—No, I do not say that. You might have a thousand people inoculated in London with proper precautions to prevent infection, and they would do no harm; on the other hand, you might have half-a-dozen unguarded and distributed over the country and they would do great harm.

10,520. When would you say was the proper dividing line between pre and post inoculation times?—At page 42 of my book there are some figures given which relate to that.

10,521. (*Sir William Savory.*) But do those statements regarding inoculation satisfy your own mind?—Do you mean with reference to its spreading small-pox?

10,522. Yes?—I think so.

10,523. Do you think that is so?—Yes.

10,524. Are you sure of it?—Yes.

10,525. You regard it as conclusive?—Yes.

10,526. Have you any argument to found upon that; for what purpose do you introduce it?—There are a great many questions that it will bear upon in my future evidence; it is not one particular point except that beyond doubt in my opinion one of the causes of the diminution of small-pox is, that small-pox inoculation has been done away with, but there are other points on which it bears, and I shall bring it forward again—for instance as to the advisability of inoculating unprotected persons exposed to small-pox. That is a question I shall bring up again in regard to statements by Marson.

10,527. You consider the evidence you have placed before the Commission to-day establishes the fact that the mortality from small-pox was increased by inocula-

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tion?—I think it was one of the great causes of the prevalence of small-pox in the past century.

10,528. But there has been a great diminution in the mortality of small-pox?—In this century, but I am speaking of the past century.

10,529. But has there not been a great diminution as the years have rolled on, especially in this century, in the mortality?—Yes.

10,530. Do you think that is due to the suppression of inoculation, from the evidence you have placed before the Commission?—I think it would greatly depend upon the suppression of inoculation; the less inoculation you had the less small-pox there would be, and the less mortality you would have.

10,531. Do you think you have established the fact that inoculation increased the mortality of small-pox upon the evidence you have put before the Commission to-day?—Yes, certainly. I think there were more deaths from small-pox in the last century.

10,532. (*Professor Michael Foster.*) Can you point out what is the defect in Dr. Guy's statistics?—I have not gone into that point; I had limited the evidence I had proposed to lay before the Commission on this subject to historical evidence.

10,533. (*Chairman.*) But the increase of small-pox by inoculation depends upon the matter of fact. Was there an increase?—Quite so, and I should regard the evidence of the leading members of the profession at the time as conclusive.

10,534. Is it not rather likely to be fallacious unless the person who makes the statement very carefully discriminates. When you have two periods, one prior to 1755, and the other subsequent to 1755, showing that there was more mortality in the one period than in the other, would it not be a very material circumstance whether the increased mortality had commenced and had been almost as marked at the time when inoculation had nothing to do with it as it was afterwards?—Quite so.

10,535. Supposing, for example, it is true that from 1720 to 1750 there was more small-pox than there was in the previous 30 years, if there were nothing else, that might point to its being coincident with the period of inoculation, but if you find that from 1710 to 1720 that increase was just as marked in comparison with the preceding 20 years as anything that could be found in any of the subsequent decennia, that would rather point to there being some cause other than inoculation, would it not?—I do not think it would disprove that inoculation may have increased the mortality.

10,536. But it would point to this, that you could not from the mere fact of the increase of small-pox in London along with inoculation conclude that inoculation was the cause?—I grant that.

10,537. Then you are proposing to give evidence of that, what is that evidence?—The evidence I have been anxious to restrict myself to, namely, the opinions and experience of the writers of the times.

10,538. Those writers seem to point to the inference to be drawn from the mortality in London—Haygarth refers to the statistics of Geneva, it is true, but still it is statistical?—Partly that and partly he speaks from personal observation extended over a long period of years.

10,539. Could anybody's personal observation be of much value in that respect; his personal observation only is that during this period of inoculation there was more small-pox than he remembered at some antecedent period—that would be all, would it not?—I think not. That case of Mr. Maitland's must have made a great impression upon his mind: he inoculated one child and spread the disease to five or six others, and if that was frequently occurring in one's practice it would be important.

10,540. In a number of instances you have said that inoculation introduced small-pox by contagion, and yet it has been said that the total result of inoculation was to decrease the small-pox mortality and not to increase it. Those two things are not inconsistent, are they? There are the two things—the extent of the small-pox and the protective power of inoculation?—Yes, that is so, but this has been brought home to me while having had a great deal to do with the diseases of animals in this country. Take a disease which has an affinity with small-pox, sheep-pox, that is to say small-pox of sheep; here we meet with the same conditions with reference to inoculation; you can protect sheep by inoculation with sheep-pox—they get a mild attack and they are protected, but if you put the inoculated animals with other sheep the disease spreads. Now if anybody asked Mr. Chaplin for permission to inoculate a dozen sheep in different parts of the country as an experiment I should look upon that as absolute madness, because I know those cases would be likely to spread the infection; they would be infective centres. That is why partial inoculation as a protection against sheep small-pox in this country is absolutely condemned. Our experience of the diseases of animals supports the conclusions which I have come to with regard to small-pox.

10,541. But has it been found from practical experience that if you inoculate for the purpose on a large scale, and so save a great many by means of inoculation, the total mortality is greater than if you had no inoculation, by reason of others catching it; is that a question of theory or of proof?—Certainly not of theory only, because in this country we have absolutely stamped out sheep-pox by means of sanitary police. If you established centres of infection you would introduce the disease and originate a mortality.

10,542. But is there any evidence to show that in such a case the protection afforded by inoculation is more than counter-balanced by the deaths which arise from the infection produced by the process?—I have not gone into any statistics upon that point.

10,543. So that that would only be after all a parallel case to the other; it is the inference to be drawn that each case of inoculation becomes itself a centre of infection?—Yes.

Adjourned till Wednesday next at 1 o'clock.



## Forty-third Day.

Wednesday, 16th July 1890.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
 Sir CHARLES DALRYMPLE, Bart., M.P.  
 Sir W. GUYER HUNTER, K.C.M.G., M.P.  
 Sir EDWIN HENRY GALSWORTHY.  
 Sir WILLIAM SAVORY, Bart.  
 Mr. CHARLES BRADLAUGH, M.P.  
 Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
 Professor MICHAEL FOSTER.  
 Mr. JONATHAN HUTCHINSON.  
 Mr. J. ALLANSON PICTON, M.P.  
 Mr. SAMUEL WHITEHEAD, M.P.  
 Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary*.

Professor EDGAR MARCH CROOKSHANK, M.B., further examined.

*Prof. E. M.  
 Crookshank,  
 M.B.*

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10,544. (*Sir William Savory*.) May I call your attention to your answer to Question 10,530, in your examination on the last occasion. Your answer with regard to the diminution of small-pox mortality is, "I think it would greatly depend upon the suppression of inoculation; the less inoculation you had the less small-pox there would be, and the less mortality you would have." What was the purpose of inoculation; with what object was it practised?—To protect from natural small-pox.

10,545. But was the small-pox, which followed upon inoculation, as fatal as small-pox contracted in the ordinary way?—No, certainly not.

10,546. Was it a great deal less so?—It was a great deal less.

10,547. Then it would not of necessity follow that "the less inoculation you had the less small-pox there would be, and the less mortality you would have"—you must draw a distinction between the occurrence of small-pox and the mortality consequent upon it, must you not?—The point in my evidence to which I wished to direct attention was this: that if inoculation had been general no doubt the effects would have been very beneficial; but that it was the adoption of partial inoculation which tended to increase the natural small-pox, and tended to increase therefore the mortality from small-pox.

10,548. Do you consider it established that it increased the mortality in that way; would you take nothing into account for the diminution of mortality from small-pox by inoculation in respect to the protection it afforded? I am not going into the question of inoculation just now, but I wished to call attention to that answer, whether you considered, seeing how it stands, that it ought to be put in that way: that "the less inoculation you had the less small-pox there would be, and the less mortality you would have." Is not that stated in too unqualified a sense; it would not follow in that way, would it?—I am speaking in regard to its being super-added to natural small-pox.

10,549. Then you would let the answer stand as it is?—Yes, I would let it stand as it is. I wish to say that there were some one or two points upon which I wished to direct attention to the evidence given at the last meeting of the Commission.

10,550. (*Chairman*.) I was going to ask you with regard to that point; have you any further matters which you could communicate to the Commission with reference to the important question how far inoculation, the result of which was only a single one or a small number of pustules, was effective or not against further attacks of small-pox?—With regard to the protection afforded by local results I have no further evidence, except from general reading. For instance, Sutton, in his book to which I shall have to refer directly, mentions and condemns a practice which was common among some inoculators of producing local effects which were totally ineffectual. And he mentions cases of small-pox occurring after those cases.

10,551. That was not merely because only one pustule or a small number were produced, was it?—

because Sutton's aim was to produce as few as possible—but because it was inefficient in some other respects?—As far as I can gather from the description that is given these inoculators obtained local results and nothing more; they were content to have merely local inflammation at the spot of inoculation and considered that effectual without any febrile symptoms.

10,552. And without any pustules?—In some cases only a local pustule.

10,553. (*Sir James Paget*.) Would you read that passage to the Commission?—Sutton refers to the practice of these inoculators in his book, and he condemns it as ineffectual.

10,554. (*Professor Michael Foster*.) At what page is that to be found in his book?—I cannot from memory give you the page, but it was in his book published in 1796. He says: "I have understood that such ineffectual inoculations as before described, if they happened to be accompanied with inflammation, itching, and pains in the head, cold shiverings, &c., have been determined upon otherwise, and the patients at the end of six or seven days have been returned to their relatives, or finally discharged, as having been conducted through the small-pox in that time."

10,555. (*Sir James Paget*.) Does he describe that local inflammation in any way?—Yes, he does; he describes what he calls "ineffectual inoculations."

10,556. (*Professor Michael Foster*.) That is, as we should say now, not specific. His contention is, that the effect produced by these inoculators was, as indicated by its character, not the specific effect which he produced even with the local pustule?—He does not draw that distinction.

10,557. But that is what he means when speaking of this inoculation?—No doubt.

10,558. (*Dr. Bristowe*.) But he always says he has "been told;" he does not say he knows anything of these cases. What you have quoted implies that he was only told or had heard of it?—Yes. He says, "I have understood that such ineffectual inoculations;" but there is one reference which I can look up, if it is worth while, to one of the inoculators who carried on this practice. He was a mechanic, an itinerant inoculator, and it was notable that in one village in which he made these inoculations, small-pox was introduced afterwards, and some of his patients suffered from small pox.

10,559. (*Sir James Paget*.) Does Sutton anywhere suggest that his own inoculation, if it produced only a single pustule, was therefore ineffective?—Not (so far as I could follow his book) if it was followed by febrile symptoms. He wanted something more than the mere local exhibition of a pustule.

10,560. But supposing that there had been the local exhibition of a pustule, and feverishness afterwards, he would have thought that sufficient?—Yes.

10,561. Was there anything to show that it was not?—No, not so far as I know.



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10,562. Not by Sutton himself, nor by any who might have doubts, nor by people after him, nor by any who inquired into the matter?—If there were symptoms of constitutional infection as well as the local pustule, they regarded that as sufficient.

10,563. The local pustule and the febrile disturbances that followed it were thought by all people to be sufficient, except by one or two, were they not? The attention of Sutton and others was called to the matter, but the belief was prevalent amongst some that unless there were considerable eruption they were not secure?—I think Sutton's attention, in 1796, was drawn to such cases by those that occurred in the practice of the itinerant inoculators. I think that is what drew his attention to it. If I remember rightly, I have pointed out in my book that some of the earlier inoculators considered that merely local effects without any febrile symptoms were sufficient. I am speaking from memory. I think we may take it that Sutton considered that was hardly sufficient for protection; that is to say, a merely local inflammation or local irritation without any febrile symptoms.

10,564. (Professor Michael Foster.) What you quoted just now showed that Sutton himself distinguished between the variolous effect at the spot inoculated and any other more general inflammation or bad symptoms which might occur. These itinerant inoculators instead of producing an actual specific local pustule, simply produced a state of inflammation and distress at the spot inoculated?—No, he does more than that, because he says not only is there a local pustule, but he says also that in some of the cases of these itinerant inoculators there were secondary pustules.

10,565. Variolous pustules?—Yes.

10,566. Where does he say that?—In his book. I cannot give you the page, but I have been reading his book through again at the British Museum.

10,567. But surely the argument which Sutton is carrying out in the quotation which you made is to show that these inoculators were not really inoculating, that is to say they were not conveying the small-pox virus?—That is the argument.

10,568. That, with the occurrence of variolous pustules, would be absolutely inconsistent?—No doubt that is what Sutton means, but at the same time he does not give any proof of it. With reference to this local pustule and sometimes secondary pustules, all he says is that as small-pox occurred after those cases those inoculations were not true small-pox; and he says we have no right to assume it was true small-pox unless we inoculated from those cases, and that was not done.

10,569. And there is no adequate evidence of the frequency of the occurrence of small-pox after such an inoculation as Sutton would himself consider a satisfactory inoculation even if the result of the inoculation be limited to the local pustule?—There is no adequate evidence as to the number of these cases.

10,570. (Chairman.) What are the other points upon which you wish to add to your evidence given on the last occasion?—The first point is with reference to the question of the cool regimen. There was a good deal of discussion at the last sitting of the Commission as to whether Dimsdale used the cool regimen before Sutton, and the answer I gave was this, that it was rather difficult to say how much Dimsdale attributed to Sutton and how much was the result of his own investigation. I have very carefully gone through the literature again to make sure of these points, and I should like to point out how the difficulty arises. The Suttonian method was first introduced to the profession, or rather they first heard of it by rumours, in 1765.

10,571. (Professor Michael Foster.) Sutton says he began in 1763?—Yes, and Dimsdale's book is written in 1766, so that that would be probably about a year after he had heard of this new system. Now in his book that was written in 1766 Dimsdale draws attention in his preface to the fact that he has been an inoculator upwards of 20 years, and he says that "humanity as well as a wish to promote the honour and advantage of the art I profess, made me ever attentive to the improvement of this part of my employment." He said he was dissatisfied with the common methods, and then he goes on to say: "Many facts had induced me to think that regimen preparation and management would do much; that as the disease was of an inflammatory kind, a cooling regimen must certainly for the most part be reason-

able. Some faint essays were made to try how far this sentiment might be just." That was what I had in my mind when I said it was difficult to say whether Dimsdale had used the cool regimen before Sutton. It certainly leads the unprejudiced reader to conclude that he had made use of the cool regimen. Then he says he had heard "with the utmost satisfaction, that in some parts of the nation a new and more successful method of inoculation was discovered than had hitherto been practised. The relators gave incredible accounts of the success, which was the more marvellous as the operators were chiefly such as, by report, could lay but little claim to medical erudition." That is all the reference that is made to Daniel Sutton to whom no doubt he is referring.

10,572. (Chairman.) But is not the cool regimen a different question from the cooling treatment of letting them be freely subject to the influence of the atmosphere; was not the latter the matter which Sutton laid great stress upon?—No, that is another point I have gone into. That was the reason that I asked you to allow me to refer again to Sutton's work. Here is Sutton's statement with reference to forcing people into the cold air.

10,573. I had understood that part of Sutton's process was that they should be freely subjected to the air?—Yes, quite so; and this is what Sutton himself says: "It has been insisted by some persons that much of my success in inoculation was obtained by forcing my patients into uncustomary and very cold air during the eruptive fever. I have never yet aimed at the gigantic power of restraining the tongue of unthinking ignorance, but for my own credit at least it is but just to say that the assertion so hazarded against me is not founded in fact. Having had other and more effectual resources for moderating the fever, I have never wished to expose any of my patients to a greater degree of cold air than was perfectly agreeable to them and consistent with their former practice, however the indications and the fever might present themselves to my own judgment." That is Sutton's account.

10,574. That seems to say that he does not do it to an excessive extent, but I rather gather from that that he did think that subjecting them freely to the air at that time was a good thing?—Having gone through the literature of the subject again, I feel convinced that the idea of sending them into the cool air as part of the treatment did not occur to Sutton at all. It arose in this way; that the effects produced by his system of inoculation were so slight that he told them they could go on with their ordinary work, that they could mix with their fellow creatures, in fact that they need not give up their occupations. Such a mild affair was considered a great improvement and it was the great secret of Sutton's success, because inoculation in the old way meant a troublesome time of preparation, and it meant also that after the operation work had to be given up for a time; whereas under Sutton's system the patients were sent straight back to their business; the arm was inoculated the sleeve turned down, and the inoculated person went about as usual.

10,575. (Professor Michael Foster.) Do you mean to say that Sutton had no preparatory treatment? Have you read his book? Is it not the fact that he had a long preparatory treatment, and was very careful of the patient during the time of the eruption; and is not this question of the cool regimen merely a contrast to the old practice, which consisted of closing up every door and window so as to keep the patients warm. The cool regimen meant an abstinence from that, and the absence of the coddling system. When the cool regimen was spoken of at that time, it meant simply that they ceased to coddle in the old fashion?—It is a matter of fact, that it was only in the mild cases that Sutton allowed them to go into the cool air; when the cases had an "uncomfortable number of pustules" he kept them indoors.

10,576. (Chairman.) At page 69 of your book, I understand you there to be giving Dimsdale's account of Sutton's treatment; is that so?—Yes, that is so.

10,577. If you look at page 69 you will find these words: "Being now arrived at the most interesting period of this distemper, the eruption, a period in which the present practice I am about to recommend differs essentially from the method heretofore in use, and on the right management of which much depends, it will be requisite to give clear and explicit directions on this head, and to advise their being pursued with



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"firmness and moderation. Instead of confining the patient to his bed or his room when the symptoms of the eruptive fever come on, he is directed, as soon as the purging medicine has operated, to keep abroad in the open air—be it ever so cold, as much as he can bear—and to drink cold water if thirsty; always taking care not to stand still, but to walk about moderately while abroad." Now does not that suggest as a novelty, as an important matter to be pursued with firmness and moderation, the keeping of the patient when the eruptive condition is on in the open air, however cold it may be?—It would if it had been borne out by Dimsdale's practice, which is just the point I was coming to. His first book is published in 1766, and then in the year 1781 he writes additional observations to the treatise entitled "The present Method of Inoculating for the Small-pox."

10,578. He may have differed from it and changed his mind, but that was his system in the first instance?—Yes, Dimsdale's. I am perfectly willing to admit that.

10,579. When did he abandon that as part of his system?—He does not tell us at what actual date he abandoned it, but a point I would like to draw attention to is that in two of my answers I seem to be saying something that is rather contradictory. Anyone reading my evidence would rather conclude that I had said that Dimsdale said one thing when he said another. Now when Dimsdale recommended the cool regimen entirely, in the full meaning of turning the patient out into the cold air, it was at the early period of his practice. Then we come to the 1781 edition, in which he says, "But the same treatment is not required where the complaints are moderate, and the constitution of the patient is delicate. I have, therefore, in such cases relaxed considerably in this particular, and it is now my practice with such patients to dispense with these injunctions. The eruption being completed, and the complaints much abated, or entirely removed, a strict adherence to the very cold regimen is by no means requisite, but on some occasions may be attended with danger. Where the eruption is abundant (which whatever may be asserted by some practitioners, will sometimes happen, notwithstanding every precaution is used), I recommend confinement to the chamber."

10,580. Is that Sutton?—No, Dimsdale.

10,581. (Professor Michael Foster.) All you wish to say is that although Sutton was obviously, as he was called, the foster-father of the cool regimen, Dimsdale himself in his later years somewhat departed from it?—I do not think it is really a matter of very much importance; that is my own opinion. My real anxiety was to show that I was perfectly acquainted with the facts of the case, and that I wanted to bring them fairly before you, and that I had given two answers which might be interpreted as being rather unsatisfactory though in reality perfectly correct. Now I should like to direct attention, again with reference to this matter of cool regimen, to Ruston's paper. Professor Michael Foster quoted one sentence in Ruston in which he said: "If I were to give the preference to one thing above another it would certainly be to the diet and medicines." If we quoted that one sentence by itself there would be some ground for supposing that Ruston did not believe in the necessity for using crude lymph; and what I want to point out is that because Ruston lays stress upon medicine the Commission must not suppose that he did not lay stress upon the period at which the lymph was taken. I lay special stress upon this because I made the statement that if you took the balance of opinion and weighed all the arguments, there was no doubt that the great secret was in using crude lymph.

10,582. What do you exactly mean by "crude lymph"?—May I allow Ruston to speak for himself, because a quotation from him was made by Professor Foster which apparently, if one was reading the evidence, would go to show that the secret was in the medicine and nothing else?

10,583. No, his sentence does not carry that; his words are: "If I were to give the preference to one thing more than another," not to one thing alone?—Now when you find that in his practice Ruston uses crude lymph—

10,584. That was apparently one of the things which he thinks of importance but of less importance?—And when, as I shall show, the medicine was of no use, Ruston's evidence goes to show that using lymph was—

10,585. When you say "no use" do you mean of no use, or no use in Ruston's opinion, because the latter is all we have to deal with?—No, I mean actually.

10,586. That is altogether a different question which does not concern us—the point as to what actually was the fact?—It does affect my statement; I in the position of an historian have had to weigh all the evidence, both of opinion and of practice, and I think this is of importance in favour of the view that it was the crude lymph; and on referring again to Ruston's book I fully expected to find from what you said that he would lay large stress upon the medicine and not upon the lymph, and then I find that he says this, first of all he begins by referring to the infection, "Infection likewise from pustules which are only beginning to fill is found to produce milder small-pox than if it is taken when they are come to full maturity; and all this variety seems to be in a great measure, owing to the different degrees of acrimony in the infection." Then speaking of the method of infection he says, "One would always choose to take it from a healthful patient who had a very good sort, and that before the pock had come to its full maturity because then it seems possessed of a less degree of acrimony." And with regard to the cool regimen in sickness, he says, "I am in no haste when the fever comes on in putting my patients to bed; on the other hand I suffer them to walk about the house, and in fair weather in the open air; the rooms are likewise kept cool, and aired as usual." Again, he says, "I have inoculated the most athletic persons, who had been exposed to the sun, had used much exercise, were just come from the sea, and had lived upon salt provisions, without any previous preparation and without subjecting them to any remarkably cool regimen; and yet by confining them closely to a proper diet, and plying them constantly with those medicines, they have nevertheless had the disease very mildly." Then in a postscript he makes the remark, "I would likewise caution them" [the public] "not to lay too much stress on the cool regimen." So that taking all these facts into consideration, I think when you take the evidence of the practice and the evidence of opinions the balance of the evidence is in favour of the belief that the secret of the new method was taking the lymph early from a mild case; though no doubt the preparation and taking care of the patient would also have some beneficial effects.

10,587. (Mr. Bradlaugh.) "Taking the lymph early," in your speech evidently referred to crude lymph?—Yes.

10,588. (Professor Michael Foster.) What do we understand exactly by "crude lymph"; what do you think they meant by crude lymph?—Lymph, and as early as they could get any.

10,589. But surely by "crude" they meant what we now call lymph as distinguished from pus—not as "early as possible," because in Ruston's own paper you will find this sentence: "Some have gone so far as to take the infection from the fluid which oozes out of the wound of the patient inoculated before he is seized with the fever; but that seems to be nothing more than a mere piece of refinement." Obviously what Ruston meant by crude matter and the others meant by crude matter was "lymph," which became changed later on into pus?—I have quoted the expression used by one of them, I do not recollect at the present moment by which, I think Chandler uses the expression "crude matter."

10,590. They all use the expression "crude matter." Dimsdale uses the expression "crude matter," and Sutton uses the expression "crude matter"?—No doubt.

10,591. (Mr. Meadows White.) On page 79 of your book you will find a quotation from Sutton?—Yes; "the smallest perceivable quantity . . . of unripe, crude, or watery matter."

10,592. (Professor Michael Foster.) That fixes it as "lymph" as compared with pus?—The point I lay stress upon is that it was lymph. On page 64 (Crookshank) Chandler said the great secret of the new system of inoculation was "the taking of the infected humour in a crude state before it has been, if I may be allowed the expression, ultimately variolated by the succeeding fever."

10,593. (Mr. Meadows White.) On page 78 you give a summary, but you speak of it in italics as though it was Sutton's own words: "He acknowledged that he had relied upon the use of *crude fresh matter*; for in his experience with *concocted matter*, the infection was



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"not so rapid"?—That points to the different results that were obtained. If you used late matter there was a liability to copious small-pox, whereas if you used early matter or lymph, the result as a rule was extremely mild.

10,594. (*Professor Michael Foster.*) Do you know why they chose it that time? Why did Dimsdale choose "crude matter" rather than "concocted matter"?—Because he had milder results.

10,595. No; if you look in Dimsdale's book you will find a sentence of this kind: "I choose, however, in general to take matter for infection during the fever of eruption, as I suppose it at that time to have its utmost activity"; you will find that at page 26 of the 6th edition of Dimsdale?—I was looking to see whether in his later work he had modified that. He says, with regard to his improvements upon his first method, in this further publication of his: "It seems not improper to add, that the method I now generally use in performing the inoculation, as believing it to be the best, is simply this. The point of a lancet slightly dipped in the recent variolous matter, which I prefer taking during the eruptive fever, is introduced obliquely between the cuticula and the cutis, so as to make the smallest puncture possible, rarely producing a drop of blood."

10,596. But I am pointing out that the reason Dimsdale himself urges as guiding him in taking lymph at a particular time is not to get the mild effect, that is to say, less of the power of the virus; he wishes to have it at the time of its utmost activity; he is guided to take early crude lymph rather than the later concocted matter owing to the bad results he attached chiefly to that later matter?—Bad results, quite so, and that was Sutton's experience also; Sutton said that when he used the concocted matter he had a more ungovernable eruption.

10,597. That is what I am putting to you; that if you take the concocted lymph you have bad consequences?—Quite so; that is the point I am maintaining all through this discussion.

10,598. It is not a question of the actual strength of the virus but of the untoward consequences?—Taking early lymph you get a very slight eruption, perhaps only a local pustule, and taking later matter you get an ungovernable eruption.

10,599. But if the eruption is a function of the strength of the virus, why should Dimsdale choose the time when that virus is at its utmost activity? Obviously he distinguished between a successful inoculation which required the best virtues of the lymph, and which he believed to be the best protection against subsequent attacks and other effects of inoculation which we may describe as untoward, and which he believed, and others with him, were connected amongst other things with the lymph being taken at too late a stage?—If Dimsdale had been here I should have liked to ask him what he meant by "its utmost activity."

10,600. My question arose from your stating that they wished to take it from mild cases, or that it should be mild. By "mild" I suppose you meant diminished activity as a virus?—When I said they wanted to have the disease mildly, I meant that they wanted to have only a few pustules.

10,601. But you see that Dimsdale thinks that the question of a few pustules or more is a matter of absolute indifference to him, or at least is not indicative of the character of the virus, because he says he wants to have the virus at the time of its greatest activity, when you might be quite sure it would produce actual variola?—I think you may be quite sure that he made that statement, to counteract the opinions of the practitioners who said, that if you take lymph it will not produce true small-pox, you give a spurious disease. Dimsdale may have said that to assure people that it really was small-pox.

10,602. But he need not have said that, because, just before that sentence, he said what you say he said, more distinctly; he said: "It seems to be of no consequence whether the infecting matter be taken from the natural or the inoculated small-pox; I have used both, and have never been able to discover the least difference, either in point of certainty of infection, the progress or the events, and therefore I take the infection from either as opportunity offers, or at the option of my patients or their friends. Nor is it of consequence whether the matter be taken before or at the crisis of the distemper. . . . I have taken

"a little clear fluid, from the elevated pellicle on the incised part, even so early as the fourth day after the operation, and have, at other times, used matter, fully digested at the crisis, with equal success"?—But are you quoting from the edition published in 1766?

10,603. I am quoting from the edition published in 1772, the sixth edition?—But then Dimsdale was a person who considerably modified his opinions and statements, he certainly would not have said that in 1781.

10,604. Where is the passage in 1781 which contradicts this passage in 1772?—It is not contradicted, but it is modified. He writes an additional work to point out the modifications as the result of his experience. First of all he refers to the preparation—

10,605. (*Chairman.*) But does he in that later work modify the view expressed in the former edition, with reference to the time of taking the matter, and the reasons for adopting that time?—He certainly modifies the indiscriminate use which he describes in 1766 and in the sixth edition 1772, because he says on page 130 of the edition of 1781, "To the third chapter concerning *Infection*, it seems not improper to add, that the method I now generally use in performing the inoculation, as believing it to be best, is simply this. The point of a lancet slightly dipped in the recent variolous matter"—

10,606. (*Professor Michael Foster.*) But what do you understand by the word "recent." Now you are introducing a fresh word. If you remember, all these persons are apt to talk of "crude fresh lymph." Now those are not synonyms, they mean two things; they mean one thing by "crude" and they mean another thing by "fresh"; by crude they mean "lymph," as we now call it, as compared with pus; by fresh they mean "matter" or "lymph" recently taken from an arm. As you are aware, the old practice was to lay upon the incision threads which had been dipped in variolous matter, and kept for some time; and one objection, if you remember, to the Suttonian practice was that it was to a great extent direct inoculation, and that the patient who was about to be inoculated was brought into contact with the actually variolous patient. That was using fresh matter as compared to the old or kept matter, and that was one of the things which was insisted upon as being one of the merits of the new method.

(*Mr. Meadows White.*) In the description you give of Dimsdale's inoculations of the Empress and the Grand Duke, taken from his work of 1781, he there insists at least he did, in point of fact, inoculate both the Empress and the Grand Duke with fresh fluid matter.

(*Professor Michael Foster.*) The old method was taking a thread which had probably been kept for some time and putting that into an incision, and plastering it down.

(*Witness.*) I am perfectly aware of all that.

(*Professor Michael Foster.*) The introduction of the word "fresh" is a protest against the old system.

(*Chairman.*) "Recent" is the word in the passage upon which the discussion arose.

10,607. (*Mr. Bradlaugh.*) Do you consider that "recent" and "fresh" mean the same thing?—Yes, "recent" and "fresh" would mean the same.

10,608. (*Professor Michael Foster.*) Then again you were speaking about "mild," but although Ruston speaks undoubtedly, as you quoted, of "choose from a healthful patient who had a very good sort," what is the evidence that the inoculators of the Suttonian period took their matter (where they did take it from natural cases of small-pox) from mild cases?—I do not remember for the moment. We have no definite statement that when Sutton was first of all successful, it was due to his inoculating from a mild case, but Adams infers that it was so for this reason, that Sutton had been an inoculator upon the old method for some time, and then he quite suddenly found that he had some very mild effects. Adams suggests that he would probably on that occasion have started his lymph quite accidentally from a case of pearl-pox or a mild form of small-pox.

10,609. How do you mean Sutton "started his lymph"?—Because he then carried on arm-to-arm variolation.

10,610. But he did not always inoculate from arm-to-arm?—He did when he could.



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10,611. But he very often could not. You read in his book that he inoculated 700 on the same day from the same individual subject; do you think he could inoculate 700 from a local pustule upon the arm?—No, I did not say he always used it.

10,612. You find a reference in his book to his frequently inoculating a large number at the same time, and in that case he must have used natural small-pox?—Very possibly; but Adams tells us that in Sutton's later inoculations the results were not so mild as in his early cases.

10,613. That 700 was in his earlier epoch. Then may I call your attention to this sentence in Sutton: "I have my objections to inoculate those whom, upon examination, I rank under the class of unfavourable subjects from such as have a very benign small-pox" (by which he obviously means natural small-pox) "or from those whose arm indicates such benignity," by which he means the local pustule, or such signs as in Sutton's opinion would mean a mild attack with a smaller number of pustules, and then he goes on "because my experience has informed me that by such a choice the subjects to be inoculated are liable to have more of the disease than they would have experienced had they been inoculated from a malignant sort, or from those whose arms indicated such malignity"?—The point to which I was drawing attention to was that Adams expressly points out that Sutton's later inoculations produced severer effects than his earlier inoculations.

10,614. (Chairman.) The point your attention is called to is this: You suggested, as it was understood, that the success of Sutton resulted from his inoculating from mild cases?—Partly.

10,615. Professor Foster calls your attention to the fact that Sutton himself, so far from thinking so, avoided using lymph from mild cases, but took it from malignant cases, because the latter class produced milder cases in the inoculated subject?—I do not accept that statement.

10,616. (Professor Michael Foster.) For "unfavourable subjects" he appears to have selected his matter from malignant cases?—If you read a few lines in that way from his book, you might come to any conclusion; it was distinctly said that the cases he made his inoculations from would not infect a bystander. He used to take persons from whom he inoculated to Chelmsford, and it was argued they would not affect the bystanders because they were such mild cases. I do not think you should use the argument that Sutton had collected malignant cases for his inoculations.

10,617. (Dr. Collins.) Did anyone succeed in securing a milder class of cases than Gatti?—I am not well acquainted with Gatti's cases. But before we have completely finished with the question of employing lymph I should like to say that Lipscomb represented, after Dimsdale's time, the inoculators by the Suttonian method. Lipscomb published a manual of inoculation for the use of the faculty in 1806, in which he says: "It should be taken invariably in the most early stage of the eruption; while in a pellucid state either from the inoculated part, or, what is preferable in the opinion of the most experienced, from the natural small-pox pustule, as soon as any fluid can be obtained from it."

10,618. (Professor Michael Foster.) "Preferable"?—Yes.

10,619. But it does not say from a severe case of natural small-pox?—No.

10,620. Dimsdale says it does not matter whether you take it from the inoculated spot or from the natural; but Lipscomb in 1806 thinks it is preferable to take it from a natural case of small-pox?—Yes.

10,621. (Dr. Collins.) He also tells us that he thought it preferable to obtain it as soon as any fluid could be obtained from the pock of the secondary eruption; was not that so?—Yes, and he adds: "It is of great importance to remember that matter taken from the most benign sort of pustules after complete maturation generally produces a later and more untractable disease than clear active matter selected from a vesicle in its earliest stage."

10,622. (Mr. Meadows White.) May I call your attention again to page 78 of your book, where Sutton seems to have established this contrast which you are suggesting?—Quite so, we come back to the same point, that is exactly what I am contending for.

10,623. If you read the passage it shows what Sutton's views was as to the difference between fresh and concocted matter?—Quite so.

10,624. (Chairman.) Is there anything inconsistent in the idea that you may take the virus in a pellucid condition, and yet take it at the time of its greatest activity, and though the infection is more rapid and certain, the results may not be so severe as by taking the matter at a subsequent date when it is not so active, and when the infection would not be so rapid or certain; but yet when the results may be as he describes it, "more irregular and ungovernable"; is there any inconsistency in the two?—I do not think so, the point is that I am supporting Sutton's view as he expresses it.

10,625-7. But you seemed to suggest that that was rather inconsistent with the idea of taking the virus at the time of its greatest activity; I suggest, may not Dimsdale's view that it was desirable to take it at its period of greatest activity be consistent with Sutton's view that you should take it in its pellucid state, and not when it becomes what he calls "concocted matter," that although the former may be the period of its greatest activity when it is most rapid and certain in its effects, yet nevertheless the result may be less serious and objectionable than if you were to take the virus at the time when it was not so active?—The question is, what is to be taken as the indication of its activity?

(Sir William Savory.) The specific character of the disease.

(Chairman.) The certainty and rapidity of the infection?

(Witness.) Would not the amount of the eruption indicate the activity?

10,628. But need it?—It might happen, of course, that you inoculated the same virus into two people, and in the one case there would be greater tendency to have a severe case of small-pox than in the other.

10,629. But in speaking of any virus, would you not say its period of greatest activity was that in which it would most rapidly and most certainly infect?—I think it would be perhaps better to distinguish between activity and intensity, that is perhaps what it comes to, it is really a battle of words. The point I wish to establish is, that if you were anxious to have a mild attack of small-pox instead of an attack of very great intensity, you must be inoculated with early lymph.

10,630. (Professor Michael Foster.) But that is not what has been contended; what has been contended is, that if you want a certain attack you must use the crude fresh lymph, that is to say, if you wish it not to be attended with ungovernable results?—The great aim was to get as slight an attack of small-pox as possible.

10,631. The great aim was to get an attack which should be as certain and as unaccompanied by untoward circumstances as possible?—I maintain that the desire was to get as slight an attack as possible consistent with protection.

10,632. But that is what you have not shown, you have shown us that they took the fresh lymph in order not to get these ungovernable conditions, but you have not shown us that it was for that purpose that they took this, or that the results were always mild?—Then I must refer you to Dimsdale. I will look up his cases in 1767 which he gives as illustrations of the new method; I would like to draw your attention to them.

10,633. (Mr. Bradlaugh.) What is your answer?—My answer is that Dimsdale's results were extremely mild, and I shall prove that by referring to the cases that he gives as illustrating the new method of inoculation.

10,634. (Professor Michael Foster.) When was this book published?—In 1766.

10,635. But they are specially quoted because they are exceptional; they are specially quoted to illustrate exceptional features; he does not quote them as ordinary cases. He illustrates that case of a single pustule, in which case when the man went away after treatment he gave variola to his wife?—I read his book and did not get that impression. He says, "The disease is usually so mild as to require little or no confinement (the complaints of by far the greater number being that they have too little of the distemper)."

10,636. I did not say that they had not a severe small-pox?—But I was anxious to establish that a certain number of them had a very mild attack of small-pox.



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10,637. (*Chairman.*) The point I understand to be this, your suggestion was that the success of this inoculation depended upon taking lymph not only crude and fresh, but from mild cases, and so producing by inoculation the disease in a mild form; that I understand to be your impression derived from reading the works; that is the point upon which I understand doubt is thrown, whether if you did take lymph from mild cases it did produce mild results?—Professor Foster said that mild cases were exceptional.

10,638. Each of your answers takes us to some other point. I think we started from this point, whether it is the fact that these inoculators derived their successes in producing mild cases by their inoculations from the fact that they used not merely crude fresh lymph but that they took that lymph from mild cases of the disease, now what have you to support that proposition, that was the point from which we started?—First of all the numerous statements that they took crude lymph.

10,639. That is not the point, it is conceded that they took crude fresh lymph, the point is, did they win their success by taking crude fresh lymph from the mild cases of the disease?—I would not say that they won their success in that way, but I think that using mild cases had a great deal to do with it, and they did that because they used arm-to-arm variolation to a great extent, and if they used arm-to-arm variolation they must have used lymph from a mild case.

10,640. That would apply in a case in which it was done by arm-to-arm variolation?—Yes.

10,641. But your attention has been called to the fact that Sutton in many cases did not use that process; have you anything to show that when Sutton did not use that arm-to-arm variolation he took care to select those cases only of disease in which the symptoms were mild?—I have no more evidence in Sutton's case, but I do put forward the evidence that is given of the inoculators in the east who were always careful to get virus from a good mild small-pox; numerous references I gave at the last meeting of the Commission. I would couple the experience in the east with the experience of Sutton and others.

10,642. Is there any other point upon which you wish to add to the evidence given on the last occasion, before going to new matter?—This is one of the points that I was anxious to bring forward, that Dimsdale concludes his book by saying that the complaints of by far the greater number of people were that they had too little of the distemper. I take that as giving some idea of the amount of eruption. I emphasize that, because the question was put to me what evidence was there of the number of pustules, and when Dimsdale says they complain of having too little of the distemper, I think that shows the mildness of the cases produced.

10,643. Does that mean the greater number of all those whom he had inoculated?—Yes. He says with regard to medicines that they are nauseous and so on, and that too much attention need not be given to them, *because the disease is usually so mild.*

10,644. Does that conclude all the additions you wish to make to your previous evidence?—Yes.

10,645. (*Sir James Paget.*) With respect to all the discussions you have been referring to among the different inoculators, did they raise the question at all whether the degree of protection from small-pox depended upon the method of inoculation?—No, that question is not raised, except in reference to the cases I have already given. There were other inoculators who were content with very little—

10,646. As to the other inoculators we know nothing of what they did or who they were; they were itinerant?—Yes.

10,647. But in all the definite discussions between Lipscomb, Ruston, and the rest the question is not raised as to the degree of protection afforded by the different methods?—That is not raised.

10,648. They were perfectly satisfied that it protected from small-pox?—Yes, I think they were quite satisfied of it.

10,649. They do not refer, do they, to the local difficulties after inoculation, such as ulcers, inflammation, and the rest which sometimes occur?—Yes. There is a reference to that.

10,650. That might be taken as one of the untoward results they speak of from some of the methods?—Here it is. Chandler, speaking of the practice of the Sut-

tonian method, says, "Here no sore arms remain for the surgeon to dress; no mortifications or abscesses have ever been known to ensue."

10,651. Therefore in that discussion the chance of untoward events arising from different methods of inoculation had been considered as to the probability of each method producing these untoward results. The different methods of inoculation might have had their values according to the degree in which they protected from local troubles—the later the lymph was taken the greater the probability one would suppose of local abscesses, ulcers, and the rest?—As to that it is difficult to draw any conclusion, because ulcers and abscesses from the old method resulted from the depth of the incision.

10,652. That would be one source, but I suppose, speaking generally, the insertion of pus or of long decayed dried decomposing pus would be more likely to produce such troubles than the insertion of recent lymph?—If you were to introduce septic pus you would be likely to produce ulcers.

10,653. That would be the case with pus kept a long time—that would become septic, would it not?—Yes.

10,654. (*Mr. Picton.*) Would you mind clearing up this point: A great number of the questions and answers lately have turned upon the issue whether the lymph was taken as soon as it could possibly be, that is to say, as soon as there was any lymph to take. You quoted recently, in answer to Professor Michael Foster, certain words which distinctly conveyed the impression that the lymph was to be taken as soon as any liquid was formed in the pustule?—I think it is already in evidence.

10,655. (*Dr. Collins.*) Dr. Lipscomb state that it was possible either to inoculate from the local pustule at the seat of inoculation, or from the pocks from the generalised eruption with success?—Yes, quite so.

10,656. Did he state that in inoculating with fluid derived from the pock of the general eruption, it was preferable or desirable to take the fluid as soon as there was any to be obtained?—Distinctly he says that.

10,657. What are the words he used?—The virus "should be taken invariably in the most early stage of the eruption; while in a pellucid state either from the inoculated part, or, what is preferable in the opinion of the most experienced, from the natural small-pox pustule, as soon as any fluid can be obtained from it."

10,658. (*Mr. Picton.*) That is the phrase I wanted to have recalled, because that seems to go a long way to settle the controversy as far as Lipscomb is concerned; he seems to insist that it should be taken as soon as you can get any liquid at all?—Yes.

(*Chairman.*) I am not sure whether I understand him to point out that so long as you take it in a pellucid state, it would make any difference whether you took it a day earlier or later.

(*Professor Michael Foster.*) So long as it was pellucid lymph.

10,659. (*Dr. Collins.*) Do you happen to know whether Dr. Gregory, who wrote in support of inoculation, stated that lymph of the 5th day is to be preferred to that of the 8th day, but that both are efficient?—Yes.

10,660. Did I gather with regard to the Suttonian method that going into the air was rather the result of the mildness of the Suttonian method than that the mildness of the Suttonian method was the result of going into the air?—Yes.

10,661. (*Chairman.*) Do not people accept Dimsdale as a correct exponent of the Suttonian method?—I think he modified his views very much.

10,662. Does not he himself more or less urge going into the air as one important feature of the Suttonian method. Does not he go the length of saying that it would be desirable in the case of people even with a bad attack of confluent small-pox to send them into the cold air?—No, not in 1781. He had had some unfavourable results in Russia from doing that, and he now confines cases of confluent small-pox to their room. (Dimsdale, page 133, 1781.)

10,663. But speaking of the Suttonian method does not he point that out as the chief, or at all events, an important feature of the Suttonian method; whether Dimsdale afterwards did, or did not abandon, the Suttonian method is another question, is it not?—He points out in 1766 when he is first describing the method that



he only speaks from hearsay as to details. I should like to lay stress upon the fact that this question of the value of the cool regimen was first brought forward by Dr. Baker. Dr. George Baker obtained information from some of the patients of this new successful method, and then he put his own interpretation upon the results. I think, in fact I am sure, it was understood that the results were so slight that Sutton held that there was no danger from infection, and therefore the inoculated could go out in the open air, children could play about as usual, and people go to their business as usual, and that was what attracted so many to be inoculated by this new method.

10,664. You have handed me a book entitled "The Recent Method of Inoculating for the Small-pox," by Thomas Dimsdale, seventh edition, 1779; is that the correct date?—Yes, but if you turn to the preface, the preface is dated 1766.

10,665. This is the original text?—Yes, that is the original text in the new edition.

10,666. If he reprinted that in 1779 as the seventh edition I suppose one may take it that it was his view at that date. He would hardly, if he had changed his practice and changed his view, have published a new edition recommending a practice which he had found to be a bad one?—Quite so.

10,667. Then we may take it that these were his views at that time?—Yes.

10,668. Up to that time does not Dimsdale treat this cool regimen as a very important feature. He says, if he were asked (Dimsdale, page 73,) whether he would go the length of treating in this way a patient who was taken with bad confluent small-pox, "Before I give a direct answer to this question, let me first ask the most experienced practitioner whether he knows any method of cure which may in bad cases be safely relied on to avert the impending danger and save his patients? The too well-known fatality of all kinds of small-pox, very clearly proves that he does not, and that no such method has yet been discovered. And if this be the case, surely a bold, and even hazardous practice is very justifiable towards any such unhappy patients who lie, as it were, under sentence of a cruel death." Then he says, "For in the practice of inoculation experience has taught me that after, as well as before the eruption, persons may safely take mercurial purges, and go out during their operation (though I have seldom advised any to do so) into the cold air, in inclement weather, without suffering the least harm, or subsequent ill consequence from it. And by this experience I was led, though with great caution, to try whether the same practice might not be safely employed in the cure of the natural small-pox, as well as the inoculated; nor have the trials been unsuccessful?"—Sutton was credited with insisting upon his cases going into the open air. Dimsdale believed what Baker said and repeated the statement. Subsequently when treating cases in Russia Dimsdale had some unsatisfactory results, and when he wrote his revised account he corrected that opinion.

10,669. I do not find any correction in the volume published in 1779?—No, the correction is in 1781 after he had been to Russia.

10,670. Therefore, there was a correction made subsequently to 1779 which experience had led him to make of that which he had properly described, I assume, as the Suttonian method?—Yes, but the point I want to explain is how this theory of the cool regimen arose. Dr. George Baker, Physician to His Majesty's Household, obtained some details of Sutton's method and his results, and he put his own interpretation upon them.

10,671. What was the date of that?—Second Edition, 1766; that was the book which no doubt Dimsdale got his information, or some of it, from.

10,672. (Professor Michael Foster.) But Dimsdale's book was written at the same time?—No, later; but the important fact is this: Dr. Baker got the information of just a few cases and then he put his interpretation upon them. He heard that the patients were walking about the streets or were sent to their work, and he concluded that Sutton insisted upon a cool regimen and forced them out into the open air, whereas Sutton himself tells you that he never did anything of the kind. Baker evidently had been having some correspondence by letter with Sutton's patients, for he says (page 16): "What follows is extracted from a letter of a very worthy and sensible, as well as a learned clergy-

man, who lives in the neighbourhood of the person of whose practice I have attempted to give some account." Then he gives an extract from that clergyman's letter: "'You seem to ascribe his success to his allowing his patients a free use of the air. It is very certain that sufficient air is allowed. But the truth is, his patients in general, are never in a situation to require any nursing. It is certainly his preparation which disposeth the body to receive the infection so slightly. I enclose to you the directions which he gave for my children.'" That is the origin of the idea of there being a cool regimen which was, I think, gratuitous on the part of Dr. Baker.

10,673. (Chairman.) This work I have before me is published in November 1766 by Dimsdale, in which he says at page 35: "Instead of confining the patient to his bed or his room when the symptoms of the eruptive fever come on, he is directed, as soon as the purging medicine has operated, to keep abroad in the open air—be it ever so cold, as much as he can bear—and drink cold water if thirsty; always taking care not to stand still, but to walk about moderately while abroad. This treatment indeed seems as hard at first to the patients, as it must appear singular to the reader; but the effects are so salutary, and so constantly confirmed by experience, and an easy progress through every stage of the disease depends so much upon it, that I admit of no exception, unless the weather be extremely severe, and the constitution very delicate." Do you suggest that that is merely derived from Baker's idea that people could go out and about because they had the disease so mildly, and that it was not deliberately adopted as part of the treatment?—I suggest that it was derived from Dr. Baker's handbook.

10,674. (Professor Michael Foster.) When they before spoke of Sutton as being the foster-father, and therefore the promoter of the cool regimen, was that a purely gratuitous statement?—I take it that Dr. Baker started the theory and that the others believed it.

10,675. (Chairman.) Why do you say in the face of what I have just read from Dimsdale, published in the same year as Baker, that Baker started the theory and that it was owing to a misconception that they wrote this, not because anybody had found it to be good treatment or said he found it to be a good treatment, but because somebody had said that some people had got the disease so mildly that it did not matter whether they went out or did not?—I look upon it as a confusion of cause and effect.

10,676. Does that conclude all you have to say with regard to the evidence given on the last occasion?—Not quite. There was another question raised, but perhaps I have already sufficiently gone into it. I was endeavouring to get further evidence as to the amount of eruption. I am looking at those cases of Dimsdale's at the end of his book. I take it that this is a list of the cases in which Dimsdale had already employed this improved method; in these cases we find the amount of eruption is given. I may be wrong that those are not ordinary cases. I must quietly read through the matter again, but having read it through I concluded they were simply illustrations of his mild cases. (See Question 10,780.)

10,677. You understood them to be illustrations of his ordinary progress?—Yes; as illustrations of his ordinary progress. I will correct that afterwards, if I find it not to be so. I see that he gives Case I., that of a man in which there were several eruptions upon the hips and one on the neck. In Case II., a healthy strong man, he says, "a very few pimples were discovered upon the decline of the symptoms" of inoculation. Then in the case of the third patient, a young man 20 years of age, that was attended with the same result as in the second case. Then in Case IV. the distemper, he said, was attended with very few pustules. Case V., a man aged 44, had no eruption, he had a very early and mild disorder. Case VI., a middle-aged man, resembled Case V., and Case VII. was a healthy man of 38, "a few pimples about the neck and arms followed these complaints, yet not such as I should have esteemed variolous on any other occasion, for some soon disappeared; and others, which remained long enough to have a little matter formed in them, proceeded to this state with great irregularity."

10,678. Having given those illustrations you might refer quite generally to the illustrations at the end of

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that book of Dimsdale's?—Many of them had not a single eruption and none of those given here, if I remember rightly, had more than 20 pustules, except one with 100. Taking those cases altogether, there are several cases with none, many with two or three, and only one or two with many pustules.

10,679. (*Dr. Bristowe.*) How many cases does he give?—The cases described are about 20.

10,680. (*Sir James Paget.*) Does he state the total number from which they were selected?—No, but he tells you when speaking of the results of the new inoculation “the complaints of *by far the greater number*” being that they have too little of the distemper.” I do not think anyone would complain that he had too little of the distemper unless it meant that he had only two or three pustules. I have here, and I would beg leave to read it as a part of my evidence, a *précis* of a complete account of the results of inoculation as given by Lipscomb, who was describing the Suttonian method in 1806. He gives here the changes each day in the arms : 1st day, no change ; 2nd and 3rd, orange-coloured stain ; 4th, more evident ; 5th and 6th, hardness felt ; puncture itches ; little pellucid fluid under a kind of vesication, the part resembling a superficial burn. 7th and 8th, pain and stiffness in the axilla ; 9th and 10th, pain in head and back, transient shiverings and heats ; punctured part, viewed through a glass, appears to be surrounded by small confluent pustules increasing gradually in size and extent ; 11th and 12th, efflorescence around vesicle extending to the size of a shilling, contents of pustule become discoloured, inflammation subsides, fever going off, appetite returning. “The complaints are usually very trivial, the patient “eats and sleeps well ; a few pustules appear, irregularly “dispersed ; sometimes the inflammation of the arm spreads “considerably and is surrounded by a few pustules. “After the abatement of the fever, and the apparent “completion of the eruption fresh pustules sometimes “make their appearance for four or five days success- “sively. These are usually not very numerous and “seldom come to maturity ; but some instances “happen in which their number is considerable ; a “circumstance undoubtedly dependent on the pecu- “liar state of the constitution at the time, and pro- “bably controllable by the due use of cathartics “and proper attention to the cool regimen. These “secondary eruptions, which it must be observed “always appear within the time commonly allowed “for the progress of the small-pox, have unfortunately “given rise to many erroneous reports of persons who “had been inoculated, having subsequently under- “gone the natural small-pox and have then created “more alarm than danger. The pain and stiffness in “the axillary glands subside ; and the matter con- “tained in the vesications appears yellow and con- “cocted ; dries up and forms a rough cicatrix. . . . . “By the method of treatment thus concisely described, “all the mischiefs of that dreadful disease, the natural “small-pox, may be prevented, a fact fully established “on the authority of the united experience of Dims- “dale and Archer, who in the course of their long lives “and extensive practice, never lost a single patient ; “and by the immense experience of Mr. Daniel Sutton “and his brothers, who are still living, to prove that “they have inoculated more than 500,000 persons with “uniform success.” Taking Lipscomb's book as a guide to inoculation, the conclusion would be arrived at that Lipscomb has very carefully described all the changes in the locality of the inoculation, and that sometimes that is all that takes place, sometimes you have a few pustules round the inoculated spot and sometimes you have a crop of pustules round the inoculated spot, and occasionally you have the pustules dispersed over the body.

10,681. (*Sir James Paget.*) He expresses no doubt as to the advocacy of that method?—No doubt whatever. There is a plate in my book which shows the result of inoculation ; and I think one might almost say as a rule that was all that was obtained by Lipscomb.

10,682. (*Sir Guyer Hunter.*) I cannot tell what inference you would wish the Commission to draw from the statement you have made?—The reason I have gone into such detail upon this point is to defend the accuracy of my book which seemed upon some points to be questioned, and to show that the statements I have made are the result of perfectly impartial study.

10,683. (*Dr. Collins.*) Will you state what the medicine was to which Ruston gave the preference?—That is an important point ; and it will give the reason why I have

not in my book given the credit of the new method to the medicinal treatment, to the powders, the medicine upon which Professor Foster seemed to lay so much stress. Sutton gives us in his work the composition of these wonderful powders ; they contained jalap, calomel, and tartar emetic. Then there is just one more point I should like to touch upon in order to show how these statements and conclusions I have arrived at have been borne out by others in later times. I am speaking from memory, but I think that Dr. Bristowe in his excellent handbook of medicine has pointed out that in inoculation certain precautions were regarded as necessary. I am not quite sure whether Dr. Bristowe mentions early lymph. I think he does. I think he also mentions that the lymph should be taken from a mild case, but I am speaking from memory, and I am open to correction, if that is not so ; but I go to another great authority, Dr. Russell Reynolds, and I there find Marson, speaking of inoculation, says “Whenever, after carefully weighing all the “circumstances of difficulty and danger, it is determined “to inoculate, the variolous lymph for inoculation should “be taken *when limpid*, and on the fifth or sixth day “of eruption, and when practicable, it should be “chosen from a mild form of disease, and inserted into “the arm in but one place, the object to be aimed at “being to give small-pox in the mildest possible way.” That may be taken as the last opinion that is worth having ; I mean that Marson was probably the last person who inoculated small-pox in this country.

10,684. (*Chairman.*) Your next heading I think has relation to small-pox before the nineteenth century?—May I be allowed to finish up another point, because it especially bears upon a question which Sir William Savory asked me, as to whether I was satisfied that small-pox was spread by inoculation. I found on examining my evidence in proof that I had not put in all the evidence that I had ready, I had intended to refer to the Commission's First Report. And again with regard to small-pox being spread by inoculation there is the statement made by Haygarth, in which he says that in Sussex they strenuously resisted small-pox inoculation, and that in Kent the mortality at the end of the last century was only 1 in 20,000. (*See Question 10,749.*)

10,685. From what disease?—From small-pox.

10,686. How did he ascertain that ; were there any records of the causes of death?—I do not remember how he arrived at those figures, but he makes that statement.

10,687. (*Professor Michael Foster.*) Upon which page of Haygarth's book is that statement ; is that made in his Chester account?—No, it is not in his Chester book, it is in a “Sketch of a plan to exterminate the casual “small-pox in Great Britain,” published in 1793 ; but I am sorry I cannot give the page.

10,688. (*Chairman.*) Do you think that is a statement which could be relied upon?—It struck me as of importance in connexion with the other statements.

10,689. Does he profess to give the death-rate elsewhere from small-pox by way of comparison with the 1 in 20,000?—Yes, the death-rate in London, which was some 2,000 yearly. I think it is important because Haygarth was a very unprejudiced person ; he was known as the “candid and accurate Haygarth” ; and he points this out in reference to a statement (that has been copied ever since into various works) that 40,000 people died annually from small-pox in Great Britain. That is a gross fallacy. Haygarth points out how it was arrived at, namely, by taking the death-rate for Manchester, Liverpool, and Chester, and then taking the population for the whole country, and presuming the death-rate in the country was the same as the death-rate in those towns.

10,690. Does not he fall into the same error when he compares Kent with London?—He points out the fallacy of taking the death-rate of the country as the same as the death-rate for London, that in the villages and small towns of England, in the south of England more particularly, small-pox was not to be compared with the small-pox in large towns, and as a matter of fact in Kent the death-rate was 1 in 20,000 ; he gives some figures to bear it out. (*See Appendix I., page .*)

10,691. But I thought you stated that he said it was 1 in 20,000, because there was no inoculation there, whereas there was in London?—The statement is brought out in this way : he is referring to the death-rate of 40,000 a year for the whole of England.



10,692. But we are rather getting away from the point we started with, which was the influence of inoculation in increasing the death-rate, and that is what we are upon now. I understood you to quote Haygarth as your authority for saying that inoculation did largely increase the mortality from small-pox, because he shows that the deaths from small-pox were only 1 in 20,000 in Kent, whereas they were very much more in London; I understood that to be the point you started with?—Yes, I am putting in these facts in answer to Sir William Savory to show the greater prevalence of small-pox.

10,693. (*Sir William Savory.*) I asked you, do you think you have established the fact that inoculation increased the mortality from small-pox (upon the evidence you had put before the Commission), and to that your answer was, "Yes, certainly"?—Quite so; but what I am doing now is adding some information with reference to the spreading of small-pox, which I had intended to give on the last occasion, and which would go in answer to the first question you asked me.

10,694. (*Chairman.*) In what way does Haygarth show that inoculation increased the spread of small-pox?—Partly, it is true, from the London Bills of Mortality, partly from the statistics of Geneva, to which I have no access, and, as I said in my evidence at the last examination, greatly from his personal observation. I do not want to lay undue stress upon that statement, but it is rather a striking statement that, according to Haygarth, where there was no inoculation there was so little small-pox.

10,695. That was in Sussex?—Yes.

10,696. That I cannot follow. In Kent you say there was very much less small-pox than in London; so there would be very much less naturally, would there not, even if you had inoculation in the population of a rural county than with people collected together as in London?—There would be less, but not in such proportion as that.

10,697. That is rather difficult to judge, is it not?—It is.

10,698. (*Dr. Collins.*) You think that it would at any rate tend to show that Kent was not bearing its proportion which one might expect from its size of the 40,000 mortality per annum?—That is so; and that shows the fallacy in the estimate, 40,000 per annum.

10,699. (*Chairman.*) It would be more satisfactory if we had a comparison of Sussex with any other rural county in which inoculation did prevail, would it not?—Of that I have only general statements, such as that inoculation in the Isle of Purbeck spread small-pox there when it would otherwise have been free from it.

10,700. (*Sir James Paget.*) Is there any evidence that inoculation was not practised in Sussex?—Haygarth says it is well known that they resisted small-pox inoculation.

10,701. (*Sir William Savory.*) But you yourself come to the conclusion that it is positively established upon that evidence. If you had said that it was evidence so far as it went, and that you drew no inference from it, that would have been another thing; but as a scientific witness, you tell us that that evidence satisfies your mind?—Might I ask if you would kindly read the question.

10,702. I asked you at Question 10,521, "But do those statements regarding inoculation satisfy your own mind?" You say in reply to that, "Do you mean with reference to its spreading small-pox?" (Q.) Yes. (A.) I think so. (Q.) Do you think that is so? (A.) Yes. (Q.) Are you sure of it? (A.) Yes. (Q.) You regard it as conclusive. (A.) Yes.—Yes, that it spreads small-pox.

10,703. You think that evidence and Haygarth's statements warrant you in saying that?—Not this isolated evidence, but taking all the evidence I have given.

10,704. What other evidence is there to make it conclusive?—It is only my opinion that it is conclusive. For instance, I wanted to give you the evidence of Moore, but that has already been put in by Sir John Simon; it is on page 66 of the Appendix to the First Report of this Commission: "The confession that must be made is mortifying to a professional man, for, according to such records as we possess, it appears that, in spite of all medical exertion, the mortality of small-pox has progressively augmented." Then Sir John Simon speaks somewhat conclusively, he says: "Inoculation, despite its advantages to individual life, was becoming a serious evil to society."

"An admirable, and till then unrivalled invention, it could only be worked at an intolerable cost of life."

10,705. (*Chairman.*) Is not the question, so far as is material for our purposes, not whether a great number of people contracted the small-pox from inoculated persons owing to the practice of inoculation, but whether the total result of inoculation, putting on one side the lives it saved, and on the other the number of persons who having caught the small-pox owing to other people being inoculated, died from it, whether the total result was an increased or diminished mortality from small-pox?—That would be important if there had not been something which could have been substituted in its place.

10,706. But I am not speaking about the question of anything being substituted for it, but upon the point which has been raised, that the diminution of the small-pox mortality after the close of the last century resulted from the cessation of, or a large diminution in, the amount of inoculation; that I understand to be the point made, and the reason why the question became important, whether upon the whole inoculation increased the small-pox mortality; is not that so?—That is not the only way in which it bears upon my evidence; but still it is an important point.

10,707. Dealing with that for one moment, supposing that there is evidence that a certain number of people caught the small-pox by reason of other people having been inoculated, accepting that as proved, what evidence is there to show that the total small-pox mortality was increased by inoculation, even after allowing for these additional cases of small-pox which would not have existed without it?—It is a statistical point, and I must say that the data are very unsatisfactory, because you have to distinguish between the mortality of the people inoculated (and they were protected) and the mortality of the unprotected, and I do not see how you can get accurate data for estimating the latter.

10,708. Therefore, the conclusion you would come to is that that is a point not proved, but which must be treated as being left in uncertainty?—I should leave it in that respect in uncertainty; but I wish to draw attention to the fact that Dr. Farr's statistics bear out the evidence of contemporary literature; he says that small-pox attained its maximum after inoculation was introduced, and that this disease began to grow less fatal before vaccination was discovered.

10,709. If that is derived from the London Bills of Mortality, which seems to be the only English source which can be relied on statistically, that is erroneous, because the increase of mortality was very manifest in the decennium before inoculation, one might say, began to be practised at all substantially?—That of course is the point that Dr. Guy maintained, and as Professor Foster drew my attention to his paper, I have gone very very carefully into that.

10,710. I am not talking of Dr. Guy, I am talking of the actual fact?—As to the actual fact, I myself if they told either way should not attribute much importance to the early Bills of Mortality; that conclusion I arrived at from studying the work of Dr. Black, the statistician of the day. Writing in 1791, he tells us distinctly that the early Bills of Mortality are not to be relied upon, and he cautions us against going upon any evidence prior to 1733, because of the alterations that were made in those Bills by the addition of parishes; so that he recommends our eliminating evidence prior to 1733.

10,711. It may be bad, but it is the best we have got; we have nothing to substitute for it?—It is the best. I may say that I was very much struck with the evidence of another statistician who, although somewhat in favour of your point, admits this. He says in a letter to Lettsom: "To prove that fewer persons died of the small-pox in London in proportion to the sum total of deaths in certain periods of years before the introduction of inoculation than in certain similar periods since, tedious tables of calculations formed on the Bills of Mortality have been repeatedly produced; but by them nothing has been proved decisive to the point in question." The point in question, I mean this point with reference to a rise in small-pox before the introduction of inoculation. Dr. Guy drew attention to this but it was not original; it had been brought forward before.

10,712. At any rate we may take it that if nothing has been decidedly proved upon that side, nothing has been proved to the contrary?—Quite so; but as Black says you cannot rely upon the earlier Bills of Mortality, let us

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take his two periods at the latter half of the century, from 1747 to 1761, when the deaths from small-pox in London were 29,165; and from 1762 to 1776, the next 15 years when they were 36,276; I have not selected these for any purpose, they are just as they have come to hand in Black's book. Now the period 1762 to 1775 is one in which, from my historical evidence, I should have expected a rise in the death-rate, because there was the new plan of letting people run about the streets after inoculation with small-pox, and people go back to their employment with small-pox, which Dimsdale says had never been done before, and small-pox inoculation was very much more employed than it had been before; on the other hand this might have been counterbalanced by a fall in the death-rate occasioned by the large number of people eliminated from the table who were protected by inoculation, and yet we find that for those 15 years the small-pox deaths amounted to 36,276.

10,712a. (*Sir William Savory.*) This is suggestive, but not conclusive?—The mortality, although it ought to have gone down in the latter period with so much inoculation, nevertheless runs up from 29,000 to 36,000; this is to say, you have some 7,000 deaths more.

10,713. (*Mr. Meadows White.*) Sutton tried to keep the people inoculated from going amongst other people, did he not?—No; that is what Dimsdale says is so extraordinary about Sutton's system. But Dimsdale was so much in favour of keeping them apart, that he objected to the establishment of a dispensary in London for the inoculation of the poor, because he said they would go on spreading small-pox.

10,714. (*Chairman.*) In the quinquennium from 1777 to 1782, would you not have expected small-pox to have been even greater. Inoculation had not gone out during that period, had it?—I should have thought that after 1776 almost everyone in London had either had small-pox, or had been inoculated.

10,715. (*Sir James Paget.*) But there would have been the children born, and they give the largest mortality?—Yes.

10,716. (*Dr. Bristowe.*) Have you any table of the number of people inoculated in proportion to the population?—I have the information that from 1746 to 1796 there were 29,890 people inoculated, and from 1746 to 1805 the number was 41,581.

10,717. That is not many, is it, compared to the whole population; that would not imply a very large protection?—But those I should say were only the inoculations carried on at the Small-pox Hospital; there were a number of other inoculations carried out. That 41,581 would probably be but a small proportion of the total number inoculated. One writer tell us that Sutton was very largely engaged in inoculating in London.

10,718. (*Dr. Collins.*) So that the statement of Dr. Farr that small-pox attained its maximum mortality after inoculation was introduced, was perfectly correct?—Yes, that is entirely borne out by the historical evidence; but I am not a statistical expert, and therefore I wish, if possible, to limit myself to historical evidence; although I wish it to be understood that I have not neglected statistics.

10,719. (*Sir William Savory.*) We listen to your statement with great interest, and the impression that the evidence you produce makes upon your mind is a very important matter to us; that was the reason why I called your attention to that answer of yours, that this evidence was conclusive, and you said, "Certainly;" if you had said it was suggestive I should have agreed with you, but that it was conclusive I was surprised to hear from you?—I would admit that I might have expressed myself differently, but I rather thought you were endeavouring to find out whether I had made up my own mind about it, and I wanted to impress upon you that it was not simply that I thought so, but that I really did believe it; that was the sense in which I wanted to give my answer. I had really thought that I had put in more evidence than I had done. Another authority that I have noted was Mr. Marson; it is generally accepted that he was a very great authority upon the subject of small-pox. He says with reference to small-pox inoculation, "The inoculated disease was usually very mild, but not invariably so. The great objection to it was that it spread small-pox just as the natural disease did. It could be set going anywhere by sending in a letter a bit of cotton thread dipped in various lymph for the purpose of inoculation; so that, although the practice was of great advantage to indi-

viduals, it was very destructive to the public at large, and the general mortality from small-pox was thereby greatly increased."

10,720. I am not in the least disputing the evidence offered upon this subject—there is a great deal of evidence both ways—but the question I raise is whether it is conclusive?—I think when you eliminate the early Bills of Mortality as fallacious, and with them the evidence of Guy, that the evidence of Farr, together with the evidence of contemporary literature, does conclusively prove it. It seems to me that Dr. Guy's statistics form the evidence which would go to weaken my proposition; but now I have read Dr. Guy's paper and I find there are fallacies.

10,721. You yourself have called the facts very unsatisfactory to-day. You have spoken of these figures in the Bills of Mortality as unsatisfactory?—Yes; but I look at it in this way: that if the contemporary historical evidence points to a conclusion, and if that conclusion is borne out by the best statistics we have, that settles the question.

10,722. Haygarth himself rested upon the same statistics?—He mentions Geneva and he mentions his own experience.

10,723. (*Chairman.*) Do you think that the impression of any medical men, however eminent, who have given cases of small-pox arising from contact with inoculated persons, would be of any value as at all conclusive of the fact that the total mortality was increased by inoculation; could such a conclusion be determined except by weighing accurate statistical evidence?—I think you would be justified in coming to a conclusion, but it would not perhaps be sufficient to satisfy the legal mind.

10,724. Say instead of "the legal mind," the scientific mind?—Well, take the case in which it was introduced into the Isle of Purbeck; they had only had one epidemic of natural small-pox in 40 years; they had a striking exemption from natural small-pox. Then some one inoculates there and spreads the disease, and people die of it.

10,725. How many people died of it?—There is no evidence given of how many died of it.

10,726. Nobody, as I understand, disputes that cases of disease may have been contracted from inoculated persons, who, if they had not been inoculated, or had not otherwise had small-pox, would not have conveyed infection; but you have first of all to take this into account, that if, according to the then theory, those people had not been inoculated, and caught the disease in that form, many of them would have caught the disease at a later date in its natural state?—But that is being assumed, is it not.

10,727. But you must assume that, must you not?—Not towards the end of the last century.

10,728. I understood you to say that you considered inoculation to be a protection?—Yes.

10,729. If it be a protection, then presumably, although not necessarily, some portion of those who had been inoculated would have had the small-pox naturally if they had not had it by inoculation; and if they had it naturally they would have been equally a source of infection to others, as if they had had it by inoculation?—Yes.

10,730. Therefore, considering how many sources of infection were created by inoculation, you must deduct the number of the inoculated who in all probability would have become sources of infection without inoculation. Then after that you have to find out, of the inoculated persons, what is the diminished mortality as compared with what would have been their condition if they had caught the small-pox naturally. You have to work out the scale of that, and then you arrive at the balance for the purpose of ascertaining whether the total mortality is greater or less. Would not all those elements necessarily enter into any such calculation if it is to be at all decisive?—Yes, certainly.

10,731. They would all affect the result, which could not be arrived at except upon a careful statistical inquiry founded upon well-vouched materials?—Yes, quite so.

10,732. Take your Isle of Purbeck man. If he had not been inoculated it is quite possible that he might have caught the small-pox naturally, and if he had caught the disease naturally he would equally have communicated the disease in the Isle of Purbeck?—



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Yes; but we have no evidence to show that he would have caught the disease.

10,733. Quite so, but you have no evidence to show that he would not; you may take it that a proportion of those who were inoculated would almost certainly have caught the disease?—Not towards the end of the last century, because there were many circumstances which I shall go into which tended to diminish the chances of infection.

10,734. (Dr. Collins.) Do I understand that you think, at any rate towards the end of the century, when the practice of allowing a patient to go into the open air who had been inoculated was in vogue, that under those circumstances an inoculated patient would be only as liable, and not more liable, to be a source of infection to others than one who had the disease in the natural way?—An inoculated case would not be as liable to be a source of infection as a natural case.

10,735. Do you think that the larger proportion of natural small-pox patients would be walking about the streets?—No, certainly not.

10,736. Do you think that a large proportion of inoculated cases would be walking about the streets?—They would.

10,737. Under those circumstances would it be fair to say that they would be on a par as regards the possibility of infecting others?—No; I do not think it would be fair to say that; that would be one of the diminished possibilities of infection to which I have referred.

10,738. (Chairman.) Now I believe you wish to say something about small-pox previously to the nineteenth century; that is your next head?—Yes. I wish to draw the attention of the Commission to the history of small-pox from the very earliest times. For instance, we may take the period from about the beginning of the seventh century up to the 18th century. We find it generally acknowledged that small-pox was an imported disease, that it was introduced probably from Alexandria about the year 640, and that it followed in the wake of the Arab Conquests over Egypt, Palestine, and Persia, along the Asiatic Coast, through Lycia, Gallicia, along the Coast of Africa, and across the Mediterranean to Spain. We do not know exactly the period at which it arrived in this country; but Haygarth expresses it in this way; he says, of that period: "Seven centuries of the darkest ignorance succeeded; and when the light of science began to dawn, this dreadful enemy of mankind, to which all had submitted and for so long a period without any attempt of resistance or escape being discovered, appeared. It has consequently been deemed unconquerable and inevitable." In fact, Haygarth says, "The first introduction and long continuance of the pestilence may be fairly attributed to an ignorant and barbarous age. But the next cause of perpetuating the calamity may probably be ascribed to the hypothesis of a physician distinguished in the highest degree for his knowledge and sagacity." He then points out that "Sydenham's views were accepted with universal assent by physicians for above a century, not only in this, but in every other country illuminated by the light of science." Sydenham's views were these: "There are various constitutions of different years which originate neither from heat nor cold, moisture nor dryness, but which depend on some occult and inexplicable alteration in the bowels of the earth, when the atmosphere is contaminated with such effluvia as render the human body liable to peculiar diseases during the influence of this constitution, which ceases in the course of a few years, and gives place to another." Sydenham further says: "We have reason to venerate the clemency and the kindness of the great and good God, because he has ordained that the pestilential constitutions of the air, or those which produce the plague, the most dreadful of all calamities, and the most fatal to the human race, should return seldom more than others which excite less mortal distempers." Now those views were accepted by the profession, for instance, Dr. Brady, Professor of Physic at Cambridge, writing to Sydenham in 1679, says: "Neither physicians nor natural historians have given the slightest idea of, much less have thoroughly investigated the various alterations and changes which you have aptly denominated here 'constitutions of the atmosphere.'" Haygarth continues: "The hypothesis of the great Sydenham has prevailed very generally among physicians during more than a century. The propagation of the pestilential, variolous, morbillous and

"other contagions is attributed to a peculiar constitution of the air, by the most sagacious and judicious authors that have appeared since that period as Mead, Boerrhaave, Van Swieten, Hoffman, Ramazzini, Huxham, De Haen. All these authorities express the opinion that some occult quality of the atmosphere is the cause of the propagation of the distemper." Then Haygarth further says: "While such an opinion prevails, the wildest visionary can never entertain a hope to retard the progress of this destructive malady, except by prayers and by recourse to the merciful interposition of Providence. It is astonishing what implicit credit this pernicious doctrine has obtained though positively contradicted and disproved by facts which lie open to every observer." Now I notice that Dr. Farr makes the statement, and I shall only repeat it for what it is worth. "Small-pox attained its maximum after inoculation was introduced; this disease began to grow less fatal before vaccination was discovered, indicating, together with the diminution in fever, the general improvement in health then taking place." This statement, which is borne out by contemporary history, has led me to inquire into the conditions which may have brought about that result; to find out what circumstances were at work tending to diminish natural small-pox, say from the year 1780. The Bills of Mortality show that the deaths from small-pox were diminishing, and the contemporary literature leads us to believe that towards the end of last century natural small-pox was certainly not nearly so prevalent as it had been for a long period of years.

10,739. (Professor Michael Foster.) Are you speaking of any particular district?—I am speaking of London. Haygarth set about his inquiry by writing to the leading physicians asking them for information upon the subject of small-pox, as to whether they believed it was communicable from person to person and to what distance the infection was conveyed, and so forth. In his work published in 1793, he quotes a letter received from a physician of the greatest eminence both in rank and erudition, who gives the following very sufficient reason for his silence on this point: "In London we have very few opportunities of seeing the small-pox. For the last five and twenty years the number of variolous patients who have fallen under my care is very inconsiderable." In answer to Haygarth, another physician practising in a large city said: "I have not seen six private patients in the small-pox in 18 years, and about seven or eight in the hospital where it occasionally crept, no one knew by what means." And Black, after pointing out certain advantages in the way of sanitary improvements, says that still small-pox "lurks in the corners of the city." Thus this diminution of natural small-pox towards the close of the last century has led me to investigate what changes may have been at work. One great cause is due to the improved education both of the profession and of the public; in the last century they were beginning to appreciate that small-pox was conveyed from one person to another, and the public were also beginning to appreciate that they could avoid small-pox by keeping out of the way of it. I think the gradual education of the profession and the public with reference to the communicability of small-pox had a very considerable effect in diminishing small-pox towards the close of the last century.

I should like now to draw attention to Haygarth's researches. Haygarth had very carefully made observations upon small-pox. He made a number of observations as to the communicability of small-pox from person to person, and how small-pox could be avoided by isolating the cases when they occurred; he drew up rules and regulations in which he pointed out that "Mankind are not necessarily subject to the small-pox; it is always caught by infection from a patient in the distemper, or the poisonous matter, or scabs that come from a patient, and may be avoided by observing these;" and then he gives his "Rules of Prevention." He proposed a regular system of notification and isolation; in fact, inspectors were to be appointed, who were to report a case of small-pox when it occurred, and people were to be rewarded for carrying out his rules, and in this way he considerably diminished small-pox in Chester. Of course that would not have been of very much value if these changes had been limited to Chester; but Haygarth's work was widely read, and he says that he had letters from different parts of the country. He tells us that clergymen in parishes began to put his rules into force with marvellous results. Whenever a case of small-pox was brought under his



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knowledge a clergyman went to the house and explained to the people that it was avoidable; not that it was a visitation from God, but that they would not have it if they did not come into contact with the disease. He started isolation, and actually in some cases stopped the epidemic of which they were afraid. Haygarth met with a great deal of encouragement, for instance, as early as 1778, Dr. Fothergill wrote to Haygarth and said, "I have mentioned the intention of freeing this country from the small-pox to divers of the faculty and shall continue to do so as it falls in my way. The proposal is variously received but in exact proportion to their humanity." What I mean to say is that both the profession and the public were becoming very widely acquainted with Haygarth's proposal of a system of isolation and inoculation. Then, in 1793, Haygarth made further additions to the plan to make it work still more perfectly. He proposed "That a law be enacted to reward the observance of the rules of prevention by poor families. Public thanks to the wealthy to be published in the parish church or newspaper. That a transgression of the rules be punished by a fine of 10*l.* or 50*l.*, one half to the informer, and the other half to the fund which supplies the expense of rewards for their successful observance by the poor. That the crime be published in the nearest newspaper. That the offender who cannot pay the fine be exposed in the nearest market town for an hour with this label on his breast, 'Behold a villain who has wilfully and wickedly spread the poison of the small-pox.'"

10,740. (*Chairman.*) None of those proposals were carried out, I suppose?—His original proposals were carried out at Chester.

10,741. Not so as to enforce those penalties, that would need legislation?—No; the penalties were not enforced, but the argument I am pressing is that although this scheme fell through, still Haygarth's teachings were silently at work. He suggested that Great Britain should be divided into districts, including a certain number of parishes or townships. That to each of them a surgeon or apothecary be appointed as inspector to see that the regulations were exactly observed. In addition, there were to be directors of inspectors superintended by a commission of physicians in London and in Edinburgh. Salaries to be paid from the county rates, and the rewards for observing the rules of prevention from the parish funds. On the requisition of the director and inspector of a circuit and district, power was to be given to two or more Justices of the Peace to appoint a separate house for the reception of the patients in the small-pox. Haygarth concludes by saying, "The plague has been completely exterminated from this country for above a century by civil regulations. There seems to be little doubt that the small-pox is propagated on principles

"similar to the plague, and that it might be certainly exterminated from the island."

10,742. This was a scheme of legislation which was not carried out; a suggestion of what could be done without legislation might be important?—That is so. I was rather drawing attention to this to show the extent of his ideas, and also as bearing upon some evidence I propose to give in the future, and because I have stated in my book that I believe we shall ultimately rely upon rules somewhat similar to those recommended by Haygarth.

10,743. (*Professor Michael Foster.*) In your book you say that the practice of inoculation was "to be altogether subsidiary," by which I take it you meant Haygarth's intention—that is on page 97.—that it was to be altogether subsidiary to the plan of stamping out small-pox by isolation?—Yes, general inoculation was subsidiary.

10,744. The name of his society was "The Society for Promoting Inoculation at Stated Periods." He says inoculation at proper intervals was from the first made a part of the benevolent institution; it is now judged expedient to propose general inoculation in order effectually to preserve the young generation hitherto spared from the natural small-pox?—The conclusion I arrived at was after taking all the facts of the case into consideration inoculation was subsidiary.

10,745. Do you remember their carrying out Haygarth's plan in Leeds and Liverpool?—No.

10,746. Do you know the language in which he refers to his plan being carried out in Leeds; they had a general inoculation in 1781, and they proposed another in 1782; he says nothing there about the isolation; he is simply speaking of his practice being carried out in regard to general inoculation. Then in Liverpool he says they had a general inoculation in 1781, in the autumn, and in the spring of 1782; they had resolved on a general inoculation there twice every year. Haygarth thought inoculation by no means an unimportant part of his scheme, he recommended general inoculation twice every year?—Not all the details and all the researches are in that book which you are quoting from.

10,747. Do you remember Haygarth's letter to Dr. Capper: "An introduction of the vaccine still more than of the variolous vaccination would effectually promote the great object of my publications"?—Quite so. I have no doubt he said so.

10,748. That it was not subsidiary in his opinion?—I maintain that in his initial scheme inoculation was a subsidiary matter, and if his revised scheme had been accurately carried out, it would have ended in their not having general inoculation at all.

Adjourned till Wednesday next at 1 o'clock.

## Forty-fourth Day.

Wednesday, 23rd July 1890.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir WILLIAM SAVORY, Bart.  
Mr. CHARLES BRADLAUGH, M.P.  
Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
Professor MICHAEL FOSTER.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary.*

Professor EDGAR MARCH CROOKSHANK, M.B., further examined.

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10,749. (*Chairman.*) With regard to the evidence you gave at the last meeting, I understand you wish to hand in a statement which might be published as an appendix to it?—I do; it is with regard to the mortality from small-pox in the country. (*See Question 10,634.*) I said there were certain statistics that were given by

Haygarth, so that I should like to give the statement in. (*The paper was handed in. See Appendix I., page 398.*)

10,750. You have still to add something to complete your statement with regard to Haygarth?—There are one or two other points I should like to deal with



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first. Here is a statement which ought to have been put in on the last occasion with reference more particularly to the number of pustules obtained by Sutton.

10,751. Does it vary the evidence given last time?—Not at all; it bears out my statement as given last time.

10,752. Where are these quotations from?—The first is from Dr. Giles Watts: "To say the truth, it is a fact well known to inoculators in this way . . . that the patients pretty often pass through the small-pox so easily as to have no more than one to five pustules." The others are from Dr. Chandler's book upon the Suttonian inoculation. Chandler says: "I have seen several here" (Canterbury) "who have had from 2 to 400 pustules." And he quotes Glass as saying "that Mr. Sutton's patients do not owe their safety to the free use of cold air." And again, "Mr. Sutton's own opinion is that the disease cannot be caught in the natural way from any of his patients . . . Really most of his patients have the disease so very slightly that one may be easily inclined to his opinion."

10,753. What was his opinion?—Sutton's opinion was that they were not infectious because they had so few pustules. Chandler relates that Sutton believed that his cases were not infectious, and he points out as affording some ground for that belief, that in so many of his cases there were so few pustules.

10,754. Could you give the Commission the reference to the page where that is to be found, so that one might see what the context is?—I am afraid I could not.

10,755. (Dr. Bristowe.) You do not put it forth as a truth that the inoculated small-pox was not infectious?—No; I am putting this forward as bearing out the statement I made that in Sutton's early cases there were so few pustules.

10,756. (Professor Michael Foster.) What meaning do you attach to this phrase, "Not one of them has had an equivocal eruption," that would indicate, would it not, that all of them had an obvious eruption?—Yes, on the arm, you must distinguish between the eruption on the arm and the general eruption.

10,757. (Dr. Bristowe.) That means that they all had obvious eruptions?—Yes, on the arm, but the number of pustules on the body, as Chandler says, was small.

10,758. (Professor Michael Foster.) I do not think that he says that in that passage at all. All he says is that they had an obvious eruption, although sometimes it was limited to a local pustule at the spot of inoculation?—He says that most of the patients had the disease "so very slightly."

10,759. (Chairman.) But as to the eruption, if you read a little further on you will see what he says?—I will read the passage: "I can truly add that they have, without one exception, gone through the disease so very slightly as scarce ever to have been sick; not one of them has been obliged to keep within doors an hour longer than is usual in a state of perfect health; not one of them has had an equivocal eruption, though some few of them have had no other appearance than that on the punctured arm; and the fullest patient has not had a number exceeding 200 pustules."

10,760. He treats it as quite exceptional?—Yes, when some of them had had no eruption at all, except upon the punctured arm.

10,761. What is the next point to which you wish to refer?—With reference to Professor Foster's opinion as expressed in Question 10,601, I should like to read a statement I have copied from Dimsdale showing that it was not a matter of "absolute indifference to him" as to whether there were a few pustules or more. This refers especially to children. He says: "I decline inoculating children under two years of age. . . . And even admitting the eruption to be favourable and not attended with any such alarm, yet should a larger number of pustules than usual appear, or any untoward symptom happen, and require medical help, the unhappy sufferer is much too young to be prevailed on to take unpalatable medicines; or submit to other necessary measures by persuasions, menaces, or bribes" (pages 10 and 11 of his book.) "It must likewise be taken into consideration that young children have usually a larger share of pustules from inoculation than those who are advanced a little farther in life; and that under this

"circumstance many have died; and the proportion of these, so far as I can learn, is too great to encourage a continuance in the inoculation of young children, so that it seems most prudent to wait till this dangerous period be over, especially as its duration is so short that the danger of their receiving the small-pox therein in the natural way is very little" (pages 11 and 12). Far from being indifferent to the number of pustules, Dimsdale actually recommends that children should not be inoculated until they are two years old, because of the number of pustules.

10,762. (Professor Michael Foster.) He says, does he not, "more than the usual number of pustules and untoward symptoms," he speaks of the two together?—No, he says "should a larger number of pustules than usual appear, or any untoward symptom happen."

10,763. (Dr. Bristowe.) That tends to show, does it not, that at that time small-pox was a more serious disease amongst children than amongst adults?—I do not think so, because he is so willing to give up inoculation; he says the danger of their receiving natural small-pox is so very little.

10,764. But he shows that in young children, as compared with adults, the effects of inoculation are more serious. The quotation tends to confirm that view, does it not?—That is so. Then with regard to Question 10,609, I was asked whether there was any evidence that in the Suttonian period there was a selection of cases made to provide the material for inoculation. As to that I should like to read a statement of Dimsdale's, which shows that he took the material from either inoculated small-pox or from distinct cases, that is to say, distinct small-pox as opposed to confluent small-pox.

10,765. (Chairman.) Is that what is sometimes called discrete?—It is. The passage is as follows: "If neither an inoculated patient is at hand, nor anyone in the neighbourhood has a distinct kind of the natural disease, a thread may be used as in the common manner, provided the thread be very recently infected; but I think it ought to be used as soon as possible after being charged with infecting matter." Then with regard to Questions 10,594, 10,595, and 10,637, the question I think was disputed as to whether Dimsdale was anxious to get mild results. I maintain that he was anxious to do so.

10,766. (Professor Michael Foster.) What do you mean by "mild results"?—Without very much eruption.

10,767. What is your authority that he meant simply that by "mild results"?—One gathers that from all the works which have been published.

10,768. If you read that account you will find that "mild results" means the general effects upon the constitution which the malady induced, fever and the like?—I think the statement I am putting in answers that question; you must take not one or two isolated lines, but the whole meaning of the publication; this is the quotation I wish to put in, and I shall put in some additional quotations. This is from Dimsdale; at page 34 of his book he says: "When matters are in this state, the appearance is unfavourable, and implies a late and more untoward disease: to prevent which I direct the powder or pill to be taken each night." That distinctly implies that he wishes to prevent an untoward result.

10,769. (Chairman.) But you must read the earlier passage to explain what is the untoward result?—He says this, "I direct the powder or pill to be taken each night, and in case it fails to operate by stool, or there is the least disposition to costiveness, an ounce of Glauber's salts, or more commonly the laxative draught already mentioned, is given in the morning once or twice, as the case may require. This course forwards the inflammation, which I always wish to see, as I have constantly observed that an early progress on the arm, and an early commencement of the eruptive complaints, portend that the distemper will be mild and favourable, and, on the contrary, where both are late, the symptoms are usually more irregular and untoward."

10,770. (Chairman.) Do you understand that as referring to the symptoms, merely the number of spots?

(Professor Michael Foster.) Where is the statement there concerning the number of pustules?

(Witness.) "In general the complaints in this state are very moderate, and attended with so little illness that



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"the patient eats and sleeps well the whole time; a few pustules appear, sometimes, equally dispersed."

10,771-2. (*Chairman.*) But does the amount of eating and sleeping depend upon the number of pustules?—I think it would.

10,773. (*Professor Michael Foster.*) Where is the evidence that that is the case?—They contrast these mild cases with what they call an uncomfortable number of pustules.

10,774. (*Dr. Collins.*) Did not you distinctly quote Dimsdale as saying "a few pustules appear"?—Yes, certainly; he says "a few pustules appear." These quotations are also in answer to Question 10,632. I think one must take all these statements together. On page 39 of his book Dimsdale says: "Those who have the disease in the slightest manner, first described, that is, without any appearance of eruption but on the inoculated part, are soon allowed to go about their usual affairs, and many instances have happened of very industrious poor men who have instantly returned to their daily labour, with a caution not to intermix with those who have not had the distemper, for fear of spreading it." Then on page 42 he says: "In the preceding pages I have described the usual progress of the small-pox from the inoculation," and then we come to page 81, where he says, summing up his results, "The disease is usually so mild as to require little or no confinement (the complaints of by far the greater number being that they have too little of the distemper) and that the disagreeable consequences which sometimes happened after the former method of inoculation are likewise by this most commonly obviated; I do not see that much alteration can be even wished for."

10,775. Do you happen to know the work of Dr. William Watson, F.R.S., Medical Officer at the Foundling Hospital?—No.

And this, I think, also points to the results that he was anxious to get. These are the recommendations for and the results in connexion with introducing inoculation in Russia. After describing the manner of inoculation he says, "On the fourth day after the inoculation they should again be assembled together, the punctures examined, and such further medicines given as the inoculator may think proper. After the seventh, the patients should be examined daily, for from this time to the eleventh, or perhaps fourteenth, is a period that requires more particular attention. During the whole of this time, and indeed throughout the whole process, the sick may continue at their own houses. And it may be reasonably presumed that there will be a sufficient number of such as are but slightly indisposed who may be able to assist the others, so as to make the expense and trouble of nurses unnecessary. But we must also suppose that, of the great number inoculated, there will be some who may have the disease severely or whose cases may require more constant attendance than they can possibly have at their own habitations. . . . It will be impossible to determine precisely how many patients may want such attendance, and consequently difficult to provide exactly the necessary accommodations; but I imagine there will not be more than four or five out of 100."

10,776. (*Chairman.*) That is where they would have it severely?—Yes.

10,777. (*Professor Michael Foster.*) What do you think that passage shows?—I think that passage shows that Dimsdale aimed at getting mild results.

10,778. A mild attack of the disease undoubtedly?—That is all I wish to insist upon.

10,779. When you say "mild" you mean favourable?—I think you must take all his works together—it is no use just quoting one or two passages; I think there is no doubt about that point; the meaning is clearly established.

10,780. Have you looked up the reference of Dimsdale for these cases?—I am just coming to that now. My next point is in regard to Question 10,676. The statements I have just read show that I was perfectly correct with reference to the mild results; especially that statement that Dimsdale makes after describing the local pustule and cases restricted to the local pustule, so I was right; but when I trusted to my memory as to the exact nature of the cases at the end of Dimsdale's book, I was wrong in supposing that those cases were illustrations of his ordinary mild results, and I wish to correct that, and at the same time to put in as evidence

a transcript of the cases, because I think it is important. (*The paper was handed in. See Appendix I., page 398.*) These particular cases of Dimsdale's given at the end of his book (I. to XII.) refer to what I would call the minimum result of inoculation which Dimsdale considered to be protective. He says, "I have seen some cases wherein the disease has happened so suddenly after infection, and with so little complaint or uneasiness, that the whole affair has been terminated, purges taken, and the patient returned home perfectly well in a week's time, before others inoculated at the same time, from the same patient and under the same circumstances, have begun to complain."

10,781. (*Chairman.*) Is this a statement taken from Dimsdale?—Yes.

10,782. Mere quotations?—Yes, mere quotations. He says, "In this case the inoculated part shows early certain marks of infection, sometimes on the very next day, or the day after, when the incision will often appear considerably inflamed and elevated. The patient about this time frequently makes some of the following complaints, viz., chilliness, itchings and small pricking pains in the part, and sometimes on the shoulder; giddiness, drowsiness, and a slight headache, sometimes attended with a feverish heat, but often without any: the account they themselves give of their feelings, is, in some, as if they had drunk too much, and in others, as if they had caught a cold. These complaints seldom last 24 hours, often not so long, and with frequent remissions, and never that I remember rise to a degree that requires confinement. The inflammation on the arm, at the time of the complaint, advances apace, and feels hard to the touch; but, upon their wearing off, the inflamed appearances gradually lessen, and the part dries to a common small scab; the skin that was before red turns livid, and the party is quite well, and nothing more heard of the distemper." And again, "When subjects of this sort first occurred in my practice I was in doubt whether they were quite secure from any future attacks of the distemper, and in order to try whether they were so or not I inoculated them a second time, and caused them to associate with persons in every stage of the disease, and to try all other means of catching the infection; and this method has been practised with the generality of such patients ever since, yet without a single instance of its producing any disorder: so that I now make no scruple of pronouncing them perfectly safe; and experience has enabled me, for the most part, to foretell in two or three days after the operation when the disease will pass in this slight manner." I have drawn out a table of these twelve cases, and the point about them which is important is this, that instead of their being illustrations of such mild cases as a local pustule followed by one or two pustules, they are cases in which there was not even a local pustule, but simply a local inflammation, and this local inflammation died away, without being followed by fever or any other complaint, and yet Dimsdale considered them protective.

10,783. (*Sir James Paget.*) Does he find any evidence of the protection?—Yes, he re-inoculates them.

10,784. With what effect?—He produced no effect.

10,785. (*Dr. Bristowe.*) Might not that be that they were persons who were insusceptible to small-pox?—I would not express any opinion as to that; I would simply put this table in.

10,786. (*Chairman.*) Were the appearances consistent with the first inoculation not having taken?—I would put them in with Dimsdale's opinion of its having taken: I am not inclined, if my opinion is of any value, to think that they had taken, but still I do not want to express an opinion upon that point. I want to put it in as evidence of what Dimsdale thought was sufficient.

10,787. (*Sir James Paget.*) Do not many of the inoculators of that time refer to cases in which they found persons insusceptible of inoculation?—Yes, and Dimsdale draws a distinction between those cases and these cases; in those cases they were persons who had had small-pox.

10,788. But where persons had not had small-pox, the inoculators refer to persons who were not susceptible to inoculation; and they compare them to persons who were not susceptible to the infection of small-pox. Some were held not to be susceptible to inoculation?—Yes, about 5 per cent.



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10,789. And certain others not susceptible to the infection of small-pox?—Quite so.

10,790. (Dr. Bristowe.) Do you not think in reference to your quotation from Dimsdale that his quoted cases were probably not cases of true inoculation of small-pox?—I do not think so; I should think those would be examples in which the result was below the limit which could afford any protection.

10,791. (Mr. Meadows White.) Are the cases which you are referring to the first twelve cases in Dimsdale?—Yes.

10,792. Those occur in the chapter headed "Abnormal Results"?—Yes, abnormal but "effectual."

10,793. (Professor Michael Foster.) Do I understand that your reading of those cases is that Dimsdale recognised in the affection of the arms no specific phenomenon at all?—I did not say what Dimsdale recognised. Dimsdale speaks of them as being "certainly infected."

10,794. (Chairman.) However, you do not attach any very great importance to them, because your impression at all events would be that Dimsdale was in error. Your table is merely put in to show the view that Dimsdale took of these cases?—Quite so.

10,795. (Professor Michael Foster.) I see in answer to Question 10,637 you say, "I was going upon the point that Professor Foster said that those mild cases" (quoted by Dimsdale) "were exceptional." You do not quite quote me correctly there. What I had said there was that the cases quoted by Dimsdale, at all events the first lot of them, were cases quoted for the sake of their anomalous symptoms?—But, pardon me, before that, you were criticising my statement that Dimsdale's results were usually mild.

(Professor Michael Foster.) I have never maintained that the mild cases were exceptional.

(Chairman.) What Professor Foster suggested was that these mild cases which were referred to in the appendix to Dimsdale's book were referred to by him as exceptional cases.

(Professor Michael Foster.) Quite so.

10,796. (Chairman.) What is the next point to which you wish to refer?—The next point is to continue my statement with regard to Haygarth.

10,797. You had not, at our last meeting, concluded all you had to say about Haygarth?—I had not concluded all I had to say about Haygarth, and I would submit that it would be an advantage to the Commission, and to science and truth, if I might be allowed to make my statement, complete it, and then to be cross-examined upon it; because I find in reading over my evidence that I have been led away from my statement and in some cases led into side issues, and it has been very difficult for me to get my mind back into its original channel. In this instance I had not completed my statement with regard to Haygarth when (Question 10,743) cross-examination upon my book is commenced. I submit that I should have been allowed to complete my statement, and that that question should have then been put to me. The point I wish now to direct the attention of the Commission to, is the position of inoculation in Haygarth's plan of preventing small-pox; and I want to direct the attention of the Commission to the fact that the book in which Haygarth first published his inquiry is entitled, "*An Inquiry how to Prevent the Small-pox. And Proceedings of a Society for Promoting General Inoculation at stated Periods.*" Now the origin of his system was this, that in 1774 small-pox was prevalent in Chester. In 1777 Haygarth proposed a general inoculation, but that was not carried out. He also meditated upon some means of preventing small-pox, and he says, "I happened to write down my thoughts in order to consider more distinctly by what means infection might be prevented from spreading, if such a measure were attempted. Doubts occurred to me concerning the opinions above mentioned. On further consideration these doubts increased, and I gradually became thoroughly convinced that both the opinions were erroneous, which have hitherto formed the bar, and, if they were true, the insuperable bar, to all human means of preventing the small-pox. Though I have long acquired a perfect conviction upon these points, from the principles explained in the inquiry, yet a diffidence in disputing opinions which had been admitted so long and so generally among physicians, induced me to solicit the unreserved criticism of my friends, wherever I could

take that liberty. For six years these papers have been circulating among my medical and philosophical acquaintance; I requested them freely to state their objections, and to send me explicit answers to the queries annexed to the inquiry, and to induce them to propose their remarks without reserve, I engaged not to publish their names, whether they approved or disapproved the doctrine I endeavoured to establish." Now the result of his own researches and the information he received from his friends, was "An inquiry how to prevent the small-pox," and the *Rules of prevention* which I have mentioned in my book; but as the people would not receive his plan for general inoculation, he put his rules for prevention into practice without it. We find on page 123 of Haygarth a report of a general meeting of the Small-pox Society on November 4th, 1778 and, inoculation was not carried out until 1781, so that, I take it, we have only to deal with his plan of preventing small-pox by isolation, which was effectual.

10,798. What do you mean by "which was effectual"?—Which produced the results which are reported. These are the results. "I, Robert Owens, surgeon and apothecary, being the Inspector appointed by the Society for Promoting General Inoculation at stated Periods, and for preventing the natural small-pox in Chester, do certify that each of the following persons has received, of the said Society, the reward of 10s., for observing their rules to prevent the small-pox from spreading; the numbers here marked referring to the place in their register of the distemper." That report concludes with these words: "I farther certify that the distemper has been stopped in ten different parts of the city, and that, as far as I can learn from minute inquiries, there are only three small-pox patients in Chester. These effects I believe to have been principally produced by the rules and the rewards of the Society." I may say that that also answers a question of your Lordship's as to whether those rules had been actually put into practice although there was no legislation. Then on page 133 we are told that, "The 'Rules of prevention' do not seem to have been insufficient for their purpose in a single instance." The question of general inoculation was referred to thus: "But if all the patients be inoculated at home, the expense will be extremely moderate, and the above-mentioned difficulty entirely removed. No objection to this method can arise from the danger of propagating the infection; because, if the inoculation be general, no subjects liable to infection would remain. But should age, indisposition, or prejudice occasion a few exceptions, yet even these will run incomparably less risk of infection from a general than a partial inoculation. For it will be performed only once in two years, or perhaps seldom, at a fixed time that will be publicly known, so that those who never had the disease may easily avoid all intercourse with the infectious." We then come to a report of this society in a Chester paper, and they say, "At a general meeting of the Small-pox Society, held the 9th of November 1779, at the Infirmary, it appeared from the report of their Inspector that since November 4th, 1778, the distemper had been stopped by the regulations of the society in 37 different places of Chester; that in 32 of these it had been stopped without infecting a second family, and in three out of the remaining five places, after infecting a second family only, in the neighbourhood; that from want of early information and other irregularities, it had spread more generally in Boughton than in any other part of the town."

10,799. Is that the same case, relating to the same set of circumstances as before, or is it a new instance?—It is a different year; it is 1779 instead of the previous year. "It appeared to the society very practicable to prevent the small-pox from spreading in Chester, if aided and assisted by their fellow citizens. The chief mischief has arisen for want of early intelligence. If the benevolent and humane would give immediate information to the Inspector, Mr. Owens, as soon as a fresh family is known to be attacked by the small-pox, they would not only save much expense to the charity, but the lives of many inhabitants. A committee was appointed to meet the first Tuesday of every month to extinguish the contagion, by distributing rewards, and executing other regulations for that purpose." In the next report of the Small-pox Society, dated 1780, they again advocate a general inoculation. They say: "It is now judged expedient to propose general inoculation in order to effectually preserve the young



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"generation hitherto spared from the natural small-pox," and again, in an address to the inhabitants of Chester, they beg them to submit to general inoculation, and, finally, in the report of the Small-pox Society for 1781 we are told that "after a week spent in inquiries for patients by all the inoculators, not a single person could be found in Chester who would enter an hospital for the sake of inoculation." The regulations for preventing natural small-pox were again established, and the report says: "At present there is not a single patient in the natural small-pox in Chester." Then in the address to the inhabitants of Chester in 1782 (again the small-pox had been introduced into Chester and was spreading) they advocate stricter attention to the rules of prevention, such as early notification, and in 1782 we find that a certain number of inoculations did take place. "Last spring 128 poor children were inoculated by the members of the Small-pox Society; these, added to the 85 inoculated in the spring of 1780, make the whole number 213." During the year 1781 the statement is made that, "considering what great numbers are liable and willing to catch the infection, this happy success must be attributed to the attention and vigilance of the Inspectors." Then Haygarth in conclusion, says, "I have attempted to prove that no person will be ever attacked by the small-pox, except after 'infection, by nearly approaching a small-pox patient, or the variolous poison in the state of serum, pus, or scab.' If this proposition be true, and if the medical faculty, with the more intelligent part of mankind, could be convinced of its truth, the chief difficulty would be vanquished. If it were generally known that the small-pox is produced by a peculiar poison, which might be certainly destroyed, and which could never do mischief except through carelessness or malevolence, it would soon be thought as criminal, being infinitely more destructive, for a person to convey the variolous poison to those who are liable to infection as to mix arsenic with their food. On this foundation I venture to suspect that medical errors have led mankind into the most pernicious habits. If this suspicion be well founded it is the duty of physicians to reconsider this important question with due deliberation." Then, after a reference to the system employed in America, (which I shall refer to directly) Haygarth says, "The letter from Dr. Waterhouse is curious and instructive. It is much more satisfactory to say that the small-pox has been exterminated than that it might be exterminated by civil regulations." And he says further: "On facts publicly ascertained to the full conviction of the more intelligent part of society there might be safely and successfully founded a general law to promote inoculation, or, what would be incomparably more easy and more grateful to the feelings of humanity, to establish regulations that would exterminate the small-pox from Great Britain." The point of all this is that in Chester, although Haygarth advocated inoculation and proposed inoculation, yet the people were opposed to it, and he nevertheless carries out his *Rules of Prevention*. Hence I have said that the practice of inoculation was to be altogether subsidiary to the plan of stamping out the disease by isolation. It would have been more correct to have said that the practice of inoculation was subsidiary, because the people would not have general inoculation, and that that conclusion, after reading the whole work, was a fair one, is borne out in a way that I shall refer to directly. I may say that this system gave way to a more complete system in 1793, the system which I gave you at the close of the last meeting of the Commission; and the conclusion which Haygarth arrived at in his second book was this, that "if all concerned, both officers and people, would perform their duty exactly, the small-pox would be exterminated out of the island in a few weeks." Before pointing out instances in which inoculation was subsidiary to isolation there are one or two other points which I wish to draw attention to in connexion with Haygarth, and I will direct your attention to the letters which he received at the same time from Dr. Waterhouse. I have given the details on pages 95 and 96 of my book. Dr. Waterhouse wrote to Haygarth to tell him that for a long series of years this system of isolation, and *without inoculation*, had been carried out in Rhode Island, for both in Boston and Rhode Island inoculation was actually discouraged: if any who resided in those parts had gone to the southern provinces to be inoculated they were enjoined "never to bring back any of their clothes worn during their

"stay at the inoculating place." This was the system that was employed in the event of a case of small-pox occurring in the town. The inspector was sent for; if in his opinion the persons were infected he took with him some overseers of the small-pox, and if they in conjunction with a practitioner pronounced it to be a case of the small-pox, the family had little more to do with the patient, who was, from that time to the conclusion of the disease, wholly under the direction of these officers, who removed him to an island where everything convenient, was already provided. They also had this system: if the disease were so far advanced before it was known to be the small-pox that the patient could not be removed without danger, the street was boarded up, the fact was advertised in the newspaper, and guards were placed to prevent any person coming to within a certain distance of the house. If a vessel arrived in the harbour with small-pox on board the sick were taken to the island before referred to, the ship was obliged to undergo quarantine. Haygarth points out this as very much his system, except that he thinks that some of the restrictions are unnecessary.

10,800. Why did Haygarth suggest this general inoculation if the system of isolation was sufficient of itself?—He with the aid of some friends got up a Small-pox Society in Chester for the purpose of promoting general inoculation, because he was opposed to partial inoculation and distressed at the prevalence of small-pox in Chester. He also turned his mind to preventing the small-pox by a system of isolation, and he put his rules of prevention into practice.

10,801. But I gathered from what you read that after he had put his rules into practice, and had his experience of isolation, he still nevertheless continued suggesting inoculation?—Yes, I say in my book that I look upon that as being subsidiary to the other.

10,802. But supposing it is subsidiary, why do you suppose he still suggested inoculation? Does not it point to the fact that he found that isolation would not effect the purpose because people would not submit to the regulations?—I think not. I can show that by further quotations from his book.

10,803. If he supposed that isolation would be sufficient of itself, why does he continue suggesting general inoculation?—It is difficult to say, because we have two things to deal with, we have Haygarth's plan for preventing small-pox, and we have the proceedings of the society for promoting small-pox inoculation which was presided over by Mr. Falconer. Then again there is this to be said, that Haygarth was in favour of general *as opposed to* partial inoculation. Then also he met with a great deal of opposition, at first especially from the inoculators, because some of the inoculators considered that his plan would do away with inoculation, and, indeed, Dr. Cappel translated his work into German as an argument against inoculation; but all I want to show now is that inoculation was subsidiary—in other words, that isolation was the sheet anchor, and inoculation was subsidiary. Haygarth never said that you must have general inoculation first, and that without that his plan would be of no use. I think I can show that by reference to his book in 1793. He points out that Dr. Cappel, of Berlin, translated his book to discourage inoculation, and he says: "This circumstance at the first view struck me with astonishment. I was utterly at a loss to conceive how my arguments, which were written to promote, could be translated on purpose to discourage this salutary art. The inference seems not to be unfair or inapplicable; as the book exhibits incontestable proofs, how easily and successfully the casual small-pox may be avoided." Then Haygarth goes on to say, "We cannot entertain a doubt that in Britain inoculation ought to be encouraged as much as possible, considering the present state of society, and the opinion which very generally prevails in this country. But plausible arguments might be suggested to render it probable that, in some other nation equally intelligent, patriotic, and vigorous in the execution of beneficent measures, especially if exposed to a less intimate intercourse with foreigners, a people to whom inoculation is unknown might with least difficulty exterminate the small-pox." (Haygarth, 1793, pages 28-29.)

10,804. (Chairman.) What do you suggest that shows?—I suggest that shows that Haygarth was quite prepared for inoculation to be subsidiary to his system.



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10,805-6. (*Sir James Paget.*) Does not that mean that he refers to a people among whom small-pox had not existed, and who might prevent its introduction?—He uses the words “exterminate the small-pox,” which is inconsistent with that supposition. Then, again, he says, “The proceedings of the Small-pox Society at Chester were suspended soon after my former publication on that subject was sent to the press” (page 481). “Our plan was to propose gratuitous inoculation to the children of our poor fellow citizens every second year. At the close of the third period when this favour was humanely offered to them, it was universally rejected” (*ibid.*). The clergy assisted in canvassing the people to be inoculated, but they did not succeed. Then he says, “In Chester, and, I believe, in most of the large towns of England, the casual small-pox is almost constantly present. All the children of the middle and higher ranks of our citizens are inoculated in early infancy. The populace, very generally, regarding the distemper as inevitable, neither fear nor shun it; but much more frequently by voluntary and intentional intercourse endeavour to catch the casual infection” (page 491). Then he concludes, “If the small-pox were excluded from a place for 10, 15, or 20 or more years, if then the contagion should be produced; if the inhabitants should unanimously refuse inoculation, and if the distemper should attack all capable of infection, its fatal ravages would undoubtedly be dreadful. But even on this worst supposition possible many lives would have been saved by excluding it for so long a period who would otherwise have perished in early infancy. However, such a calamity, in case the proposed plan were adopted, it is highly probable cannot be justly apprehended.”

10,807. (*Mr. Meadows White.*) Does the proposed plan there exclude inoculation?—Yes; because he is referring to a case in which the inhabitants refused inoculation.

(*Chairman.*) However, probably it will be necessary for members of the Commission, if this point is to be dealt with at all, to look to Haygarth for themselves to form their own conclusion as to what he means now that you have drawn their attention to it.

10,808. (*Professor Michael Foster.*) In his rule No. 18 he suggests, “That inoculation be generally encouraged through Great Britain. That, in large towns, inoculation, at stated periods, must be performed, as already practised in Chester, Liverpool, Newcastle, Leeds, Dumfries, &c. That in small towns and villages, where the casual small-pox appears more seldom, little variation in the present method of proceeding need be required. That when the families of the more opulent are inoculated, the same benefit should be offered to all. What is commonly done through a principle of benevolence and humanity the law might require to be universally performed” (page 128)?—Quite so. That shows that in small towns and villages it was not absolutely necessary that inoculation should be insisted upon.

10,809. (*Chairman.*) However, you suggest that the true view of Haygarth’s writings is that he advocated isolation as the primary means of stamping out small-pox, and he advocated inoculation as a subsidiary means?—In the first instance, inoculation came first, but ultimately it turned out, as you say, that isolation was the great principle, and inoculation subsidiary. We must distinguish between what Haygarth first had in his mind, and what was the ultimate result of his experience.

10,810. On the whole, your view is that he regarded isolation as the more important, and inoculation as only subsidiary?—Yes.

10,811. (*Dr. Collins.*) The subsidiariness of the inoculation, as I gather, was rather the result of popular opposition than of Haygarth’s advocacy?—That is so.

10,812. (*Chairman.*) Does that cover all you have to say in reference to Haygarth?—There is only one more point; your Lordship said at the previous sitting that this matter would have been important if it had been put into practice, and I want to point out what Haygarth says, “These new practical principles were thus submitted to the fairest and completest test for six years, in a large town where many hundreds of the inhabitants, who never had the small-pox, were mixed with others in all stages of the distemper and yet were preserved from the infection, as far as they would submit to the following regulations.” These were his Rules of Pre-

vention. This is in Chester where they refused general inoculation. He also speaks of “proofs of the sufficiency of those rules to guard mankind from the ravages of the fatal pestilence and the testimony of the citizens of Chester that the Rules of Prevention had proved fully adequate to their purpose,” the Rules of Prevention being those I have so often referred to. Then there is the ultimate conclusion which I have already given. “If all concerned, both officers and people, would perform their duty exactly, the small-pox would be exterminated out of the island in a few weeks.”

10,813. Have you any evidence as to whether that practice continued to be followed in Chester, or of the extent to which it was followed elsewhere?—The system, as a system, was suspended. But, first of all, let me speak with reference to its being carried out elsewhere without inoculation; we are told that the clergy in the villages sometimes explained to the people this entirely new doctrine, that small-pox was a disease that could be avoided, Haygarth says, “The clergyman whose judicious and spirited exertions have contributed the most essential service to establish and to propagate the doctrine on which the proposed measures are founded is the Rev. Mr. Stephen Moore, Vicar of Brodesworth, near Doncaster, in Yorkshire. He has proved by several authentic facts with what ease and certainty the minister of a country parish can prevent the introduction or suppress the communication of the casual small-pox in his neighbourhood.” Then here is another quotation, although in Chester, the system as a system was given up, Haygarth says, “Before the establishment of our society, children in all stages of the casual small-pox often frequented our streets, rows, and walls, which are the public walks of the town, because few feared or blamed their conduct. By the regulations of the society our fellow citizens were taught that such intercourse between the infectious and those liable to infection might have pernicious consequences, and during the several years which have elapsed since the cessation of our preventive measures, I have never seen such a patient in any place of public resort.” That is the education of the public I was alluding to on a previous occasion as the result of Haygarth’s researches.

10,814. Is there anything to show why those regulations were given up if they proved so beneficial?—I cannot say whether it was want of funds or what it was, unless it was that a more perfect plan was brought out in 1793, entitled “A sketch of a plan to exterminate the casual small-pox from Great Britain, and to introduce general inoculation.” This was dedicated to the King. The proposal was to introduce compulsory notification, in fact, it was the scheme which I gave you at the last meeting of the Commission. I take it that ultimately there would have been legislation; but a few years afterwards, when the promise of “perfect and everlasting security” was made by the promoters of cow-pox inoculation, Haygarth’s system was ignored and lost sight of. Haygarth has apparently been ignored ever since, but not his teachings.

10,815. May it not be that the society found a difficulty in inducing people to submit to the regulations of isolation which alone would be effectual?—I gather not, from the reports that are given. The reports of cases and of rewards were published.

10,816. You may find a certain number of people who submit, and get rewards for submitting, but I apprehend you may have a deadweight of opposition, or passive resistance, which it is very difficult to get over?—There is no evidence of that in Haygarth’s writings, or in contemporary literature, so far as I can see. There was no opposition to isolation, but there was to inoculation.

10,817. (*Dr. Bristowe.*) What evidence is there of any general isolation being carried out in Chester?—The number of persons rewarded are given in Haygarth’s book.

10,818. Is there any proof that all the persons who had small-pox were thus separated?—There is the evidence given in Haygarth’s book.

10,819. (*Chairman.*) I cannot say that I understand still, why in his very last work, he still recommends inoculation, if he had confidence in isolation as a practical system?—I have said it was to be subsidiary, not that his plan was to be without inoculation.

10,820. But if the system was to be a perfect system without inoculation, which is what you suggest, why should he still have continued to advocate inoculation



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as well as his system of isolation?—One reason was, as he says, the opinion of the profession; and the opinion of the profession was very strong upon the value of inoculation.

10,821. Do you think that [in a town like Chester a system of such complete isolation as would be necessary, if you were to deal effectually with small-pox, could be easily brought about voluntarily?—At present I would rather not give an opinion upon that point, but restrict myself to what Haygarth's researches were, and the effects of his system.

10,822. But Haygarth had not come to the conclusion that it could be done. Does not the fact that inoculation could still be carried out, as well as isolation, indicate that isolation was not sufficient; else why trouble about inoculation?—His statement with regard to Dr. Cappel's translation of his book rather bears upon that point. He says, "I was utterly at a loss to conceive how my arguments, which were written to promote, could be translated on purpose to discourage this salutary art."

10,823. His book was written to promote inoculation, but why was he seeking to promote inoculation if he had propounded a scheme which would produce a completely satisfactory result without inoculation?—But, pardon me, he does not say that; he has, so to speak, floated his society for the promotion of general inoculation, and though people would not have general inoculation he puts his plan of isolation to work.

10,824. But when I asked you just now whether you thought the plan of isolation would be sufficient of itself you referred me to Haygarth; then I ask, Did Haygarth think so? It seems that he did not think so, because it appears that to the last he advocated inoculation as well?—He thought that general inoculation as a subsidiary thing was an advantage.

10,825. (*Professor Michael Foster.*) What I wanted to ask you was what you meant by "subsidiary"?—I meant it was employed where it could be employed, and if there was an objection to it they had the isolation system without it.

10,826. (*Sir James Paget.*) Does Haygarth anywhere imply that that was his opinion?—He does not give it definitely as his opinion, but he does give instances where general inoculation could be suspended.

10,827. Is not his answer to Cappel distinctly intended to show that he did not advise other than that inoculation should be general?—Certainly not; he says Cappel's inference is not "unfair or inapplicable; as the book," that is his own book, "exhibits incontestable proofs, how easily and successfully the casual small-pox may be avoided."

10,828. But after that, at all times, his scheme includes general inoculation?—Yes, he continued to advocate it as "a salutary art."

10,829. (*Chairman.*) Apparently he would rather mean there by "casual small-pox," some time when small-pox was not epidemic; that by isolating individual cases you might prevent its further spreading; I suppose that is what he means with reference to casual small-pox?—Yes; it means that.

10,830. Does that conclude what you have to say with reference to Haygarth?—Yes, that concludes my statement as to Haygarth's system, and to what extent it was carried out. I shall pass on directly to a statement as to how far Haygarth's views were accepted by the profession?

10,831. (*Sir William Savory.*) In answer to a question put by the noble Chairman you hesitated to express an opinion upon the efficacy of isolation, did you not; you referred back to Haygarth, and you said you would rather not express your own opinion?—Not for the moment.

10,832. But you have given a very positive one in your book?—But I am not being examined now upon my book, but upon my statement.

10,833. I am not examining you upon your book, but asking you whether, in face of the statement you have published, you hesitate at giving an opinion upon the subject?—There is no hesitation as to the statement.

10,834. But you have laid it down in your book positively, have you not, that isolation is a remedy?—Yes.

10,835. Here is your passage at page 465, four lines from the bottom, "Indeed, I maintain that where isola-

tion and vaccination have been carried out in the face of an epidemic, it is isolation which has been instrumental in staying the outbreak, though vaccination has received the credit"; that is positive enough, is it not; and then you deal with matters to the same effect in the subsequent paragraph?—Yes.

10,836. It astonished me that you seemed to hesitate to express this opinion just now?—I was not hesitating to give an opinion, but it would be more convenient that I should deal with that in a subsequent statement. My heading now is "Haygarth's researches"; as to any opinion you would receive from me on this subject I propose to deal with hereafter.

10,837. The fact is that you have no hesitation upon the matter?—No, I have no hesitation upon the matter, but I propose to deal with that later on.

10,838. (*Sir Charles Dalrymple.*) In an answer to the noble Chairman, a short time ago, what did you mean by saying that want of funds led to the abandonment of a system so very beneficial in Chester?—I said it might have been want of funds.

10,839. What did you mean by that?—They had to pay money rewards for notification, and there was an expensive arrangement for the services of the inspectors and so on. The complete scheme as proposed in 1793 would have been an expensive one. There were to be not only inspectors in the different counties, but paid officials; and Haygarth actually gives an estimate of what it would cost per annum.

10,840. (*Sir James Paget.*) The persons submitting to the regulations were to be paid for their submission?—Yes, there were to be both rewards and penalties.

10,841. (*Professor Michael Foster.*) You said, as I understood you, that Haygarth at first proposed general inoculation, and only proposed his second plan on account of the difficulty he met with in carrying out the general inoculation?—At first he proposed it, but he was not the first to propose it,

10,842. Did I understand you to say that?—Yes.

10,843. What is your evidence of that, that is to say, that he introduced a system of isolation because the inoculation could not be carried out?—He says on page 8, "In the year 1774 the natural small-pox was so dreadfully fatal to the poor inhabitants of Chester as to produce a deep impression upon my mind, especially when I considered that it was possible to prevent such destruction. Ever since that time it has been an object of my most anxious wishes to preserve their lives by inoculation"; so that in 1777 he proposes a plan for this purpose, and he is joined in it by the leading citizens and Mr. Falconer, who became chairman of the society. "But this business was beset by so many difficulties, real and imaginary, that a general inoculation of the poor was not executed till 1780."

10,844. Where is the evidence that he was led to the system of isolation on account of the difficulty of inoculation?—I did not say that. Allow me to read the passage, he says, "As I was meditating upon some safe method of general inoculation, I happened to write down my thoughts in order to consider more distinctly by what means infection might be prevented from spreading, if such a measure were attempted." Now we know from the report of the Small-pox Society that those rules of prevention were actually carried out and the rewards given, although it was not until 1780 that general inoculation was executed.

10,845. I understood you to say that Haygarth introduced his plan of isolation because he could not carry out his previous plan of inoculation?—Not "because."

10,846. That was not your opinion?—That is not what I intended to say.

10,847. He introduced inoculation and isolation?—He introduced first inoculation and then he meditated upon his other plan.

10,848. What is the feature by which Haygarth's system is known—it is isolation, is it not?—His book is "An inquiry how to prevent small-pox," that is one part, with rules of prevention. The other part is, Proceedings of the society to promote general inoculation.

10,849. Haygarth's system is a system of isolation accompanied, at all events in the great majority of cases, by a general system of inoculation, is it not?—Yes, that is what I say in my book, on page 97, that Haygarth proposed to have inoculation at stated intervals.



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10,850. I did not understand why you said it was not continued at Chester?—I cannot recollect why it was not continued, but I suggested that it was possibly a question of funds.

10,851. Do you appreciate the difficulty which may be felt to arise from a system of compulsory isolation?—His original system was not one of compulsory isolation.

10,852. Say, of isolation?—I cannot appreciate the difficulties in Haygarth's time.

10,853. His system was not compulsory, but you some little time ago made the statement, I think, that if it had not been for the introduction of vaccination, as you believe, Haygarth would have made inoculation compulsory?—Not at all; in the system published in 1793 notification was compulsory.

10,854. What happened between 1793 and the introduction of vaccination?—I cannot tell you.

10,855. Was his system flourishing up to the introduction of the system of vaccination?—Yes; that comes under my second heading as to how Haygarth's principles were accepted by the profession.

(*Chairman.*) We shall come to that afterwards.

10,856. (*Mr. Meadows White.*) I cannot gather from your book what editions Haygarth's book passed through—I thought you alluded to three volumes published—I can only find a reference in your book to Haygarth's inquiry, "How to prevent Small-pox," published in 1784?—There is also "A Sketch of a Plan to exterminate the Casual Small-Pox and to introduce General Inoculation," published in 1793. Those are the only two books I deal with now; and at the last sitting of the Commission I was giving you an abstract of his book published in 1793.

10,857. They are, I suppose, only accessible at the British Museum?—They are both at the British Museum.

10,858. What you have given the Commission to-day, and on the last occasion, is a summary of your reading of those two works?—Yes.

10,859. Is there any other book to which you can refer which will give a contemporary account of the matter?—Yes, I will come to that next.

10,860. (*Mr. Picton.*) Was not Haygarth's system an anticipation substantially of the system as at present carried on in Leicester?—It might be called the forerunner of the Leicester system.

10,861. You have sufficient information of what is done in Leicester to be able to say that; you know the system that is adopted there?—I do not know the details exactly, but the general principles I know.

10,862. You know it consists in compulsory notification and subsequent isolation?—I know that.

10,863. Are you aware that in Leicester there are several medical practitioners who think that isolation is a sufficient preventive, but who still believe in vaccination as an additional advantage?—I was not aware of that.

10,864. But do you see any inconsistency in the two propositions?—I do not.

10,865. Then was Haygarth more inconsistent in believing both in inoculation and isolation?—Not at all.

10,866. Was not it quite consistent for a man to believe that isolation was a sufficient remedy, but that inoculation also had its value; and was that his opinion?—I think it would be strictly accurate to say that that was the position of affairs, if it was not absolutely Haygarth's opinion. I am inclined to the belief that it was also, latterly especially, Haygarth's opinion as well.

10,867. What I want to know is this, do you think that the fact of his still believing in inoculation should show that he did not believe in isolation?—Not at all.

10,868. (*Dr. Collins.*) I understand you to express yourself in agreement with Professor Foster that Haygarth's method might be briefly described as one of isolation supplemented by inoculation?—Yes.

10,869-70. Where possible?—Yes.

(*Professor Michael Foster.*) "Conjoined with inoculation," was, I think, the way I put it.

10,871. (*Dr. Collins.*) In Boston and Rhode Island I gather that isolation was practised, but that inoculation was discouraged?—That is so.

10,872. Did Haygarth give information that he received from Dr. Waterhouse respecting the practice in those localities as evidence of the success of his system?—He did.

10,873. Do you happen to know that a Bill was introduced into the House in 1808 to prevent the spread of the infection of small-pox, which made provision to limit the indiscriminate inoculation which had been going on, and to set apart certain houses for the reception of the sick, and so on?—I do.

10,874. Do you remember the preamble of that Bill?—I do not.

10,875. It is, "And whereas inoculation of persons for the disorder called small-pox according to the old, or the Suttonian, method cannot be practised without the greatest danger of diffusing the infection and thereby endangering the lives of His Majesty's subjects?"—I did not remember that.

(*Dr. Collins.*) That Bill was introduced subsequently to the introduction of vaccination.

10,876. (*Sir James Paget.*) You have, of course, read what Haygarth's system of isolation was?—Yes, I have.

10,877. Do you think that was effective or would be regarded as effective at the present time; does not he say, for example, that the infection of small-pox cannot be carried above half a yard?—He does say so.

10,878. Would that be held probable now?—Possibly not, if limited to half a yard.

10,879. Does not he also say that the contagion of small-pox could not be conveyed by the clothes of those who had visited a patient?—Yes, he does say so.

10,880. So that in both those and some other particulars his system of isolation was very much less urgent than would be required at the present day?—He was willing to admit that there were probably defects in his system.

10,881. But those were not the defects in his view; he was very positive that the infection of small-pox could not be carried above half a yard, and that the infection of fever could not be carried so far as that, and that the contagion of small-pox could not be conveyed except by actual contact with the clothes of a patient or some secretion or material derived from the small-pox?—That is so.

10,882. But that is certainly not believed now?—No, I think not.

10,883. He would, for example, have let any one attend a patient for small-pox, and yet not think that that person need be separated from association with others?—Yes, he makes a reference to that; he proposed that a ward in each hospital should be ready to receive all poor patients taken ill of the casual small-pox, and "the attendants of such wards by easy instructions and habits in the simple rules of separation and cleanliness would effectually preserve all the other patients from the danger of infection. This observation is fully warranted by the perfect safety of two such wards in the Chester Infirmary appropriated to the reception of contagious fevers ever since the year 1783. Such a receptacle for patients in the casual small-pox would be quite as safe, cheaper, and more com- modious than a pest-house." So that he appeared to think there was evidence to support his opinion.

10,884. Do you think he was right in that?—I should question that very much.

10,885. Is there not evidence in this present day that in the immediate neighbourhood of the small-pox hospitals there is a much larger proportion of cases of small-pox than in any other part of the town?—I have not gone very fully into that question.

10,886. (*Sir William Savory.*) You used the term "isolation" just now; that referred only to the isolation of people who had the small-pox?—Yes.

10,887. That referred only to the isolation of those who exhibited the eruption?—Yes.

10,888. But are you aware that there is another system of isolation carried out in some parts where not only the person who has the eruption is isolated, but all who have been connected with him?—Yes, that is so in Australia, and is a more perfect system.

10,889. Haygarth does not refer to that, but only to the isolation of the individual?—That was so, I think,



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whether it was so in Chester or only adopted in later times, I will endeavour to ascertain, if you wish.

10,890. When you refer to "isolation," are you referring to the isolation of the patient only, or to the isolation of all who have been in connexion with him. I do not know to which point you are referring?—That is again a point I would rather deal with under another heading.

10,891. (*Chairman.*) What is the next point in reference to Haygarth that you wish to bring before the Commission?—The next point is as to whether there is any evidence to show that these opinions were accepted by the profession. I would first of all point out that the profession were really ready to hear of some such plan, because Mead, in 1720, had recommended separation and quarantine in contagious diseases, and had used the term "suppressing infection." He spoke of it in reference to the plague; he advised notification and isolation, in fact, his system may be said to be one of notification and isolation and disinfection; for he mentions the value of sulphur; he speaks also of the necessity for cleanliness; he also says, "Nor do I think that in this island particularly there is any one instance of a pestilential disease among us of great consequence which we did not receive from other infected places. This I rather mention because it is a common opinion, and propagated by authors of great name that we are usually visited with the plague once in 30 or 40 years; which is a mere fancy without any foundation either in reason or experience, and, therefore, people ought to be delivered from the subjection to such vain fears." And Sir John Simon in his recent work on sanitary institutions says that "from this advice of his there dates in England so greatly an improved understanding (as compared with 50 years before) of the spirit in which dangers and pestilence ought to be dealt with." Civil regulations were carried out in the case of the plague and the plague was stamped out.

10,892. (*Sir James Paget.*) Could we use the term "the plague was stamped out"?—We cannot say exactly how far the civil regulations were effectual in stamping it out, that is to say, whether they actually stamped it out or whether they extinguished a flickering flame. I quoted just now the expression that was used by Haygarth. (*See Question 10,993.*)

10,893. (*Chairman.*) Or whether the flame flickered out of itself?—Possibly; but they certainly prevented its being introduced by quarantine, and they stopped cases when they were reported, so that the profession would seem ready to hear of a plan in reference to small-pox, although it had apparently not occurred to anyone until Haygarth brought it forward as quite an innovation. I can give evidence of that by a reference to the "Medical and Chirurgical Review," 1799. Under the heading "Establishments for the extirpation of small-pox," mention is made of "the ravages of small-pox since its first appearance in Europe," and that "since the year 1721 its mortality in Germany has been endeavoured to be lessened by the practice of inoculation. But the lists of mortality show that this desirable end is far from having been fully attained. Plans for total extirpation of the small-pox, therefore, have been suggested by philosophers of various countries, and the probability of being able to effect it is amply shown. To do this, however, the exertions of the physician are incompetent, unless they be aided by the powerful hand of Governments, but this has hitherto been withheld. The grand means, however,"—this, remember, is from the leading medical paper of 1799—"The grand means, however, of extirpating this destructive malady is an early and strict separation of the infected from those that are sound. In the year 1796 the Prussian College of Physicians made a favourable report to the King on this project, when it was resolved to establish a house for the purpose in the city of Halberstadt. It is to be hoped that other countries will at length open their eyes to their true interest, and adopt a plan which cannot fail materially to affect the population of Europe. It will not be necessary then to attempt to disarm one disease of its powers by the introduction of another, the consequences of which cannot be fully known for a series of years to come." The editor also goes on to say, "The practicability of extirpating the small-pox has been in a great measure already proved in the province of Rhode Island as well as in a part of France. In a small commune in the department of Côte D'Or, the small-pox has not been known for a vast length of time; as soon as the inhabitants learn that this

disease has shown itself in the neighbouring states "they immediately abstain from all communication." Then Dr. Ring, who may be called Jenner's lieutenant, writing in the "Medical and Physical Journal" on February 12th, 1801, says, "Leaving everyone to form his own opinion concerning permanent preventives, I beg leave to conclude with expressing my opinion that if medical men perform their duty and sincerely unite in their endeavours to exterminate the disease, we shall not long have occasion for a permanent preventive or even for any preventive at all; provided care is taken to enforce a proper quarantine when any vessel arrives from foreign parts where that worst of plagues—the small-pox—may happen to prevail." Then, again in the "Medical and Chirurgical Review" of July 1799, there is a reference to certain experiments performed in France. "In one of the Paris hospitals a number of children with the small-pox were kept in the same ward with others that had not gone through the disease, separated, however, from each other by a double rail or grating at such a distance only as to prevent their touching each other, but without preventing their seeing and conversing together, or even their breathing the same atmosphere. Not one of the sound became infected. It is evident, therefore, that in hindering all communication by contact, direct as well as indirect; of the sound with the infected, a certain means exists of finally destroying the contagion. But to do this with effect is as much a matter of police as is the destruction of the plague and other analogous diseases." (*See Question 11,015.*)

10,894. (*Sir James Paget.*) Do you accept that as true?—The experiments, I should think, were doubtful; but I am only pointing to the accounts given in contemporary literature showing how this subject had come forward for discussion; I am not putting in these experiments as accurate or otherwise, but showing how the subject had come up for discussion.

10,895. (*Dr. Bristowe.*) This is an anonymous writer?—He is the editor of the "Medical and Chirurgical Review."

10,896. But still he is anonymous?—Yes. Then, again, and this answers a question I was asked by Professor Foster, Thompson says (page 140) that "the benevolent were solicited for this purpose by the venerable Dr. Haygarth and by other individuals, and the arrangements to which they were giving rise in various parts of the world were suddenly superseded by a discovery the most wonderful and important of any that is to be found in the annals of medicine." Then, again, Willan, at page 104 of his book "On Vaccine Inoculation" published in 1806, refers to the regulations introduced in 1805. He says, "A general plan for extirpating the small-pox and for preventing its future diffusion among us surely merits consideration much more than any palliative method of superseding this disease, or of mitigating its severity. Government has lately established a Board of Health to prepare and digest rules and regulations for the most speedy and effectual mode of guarding against the introduction and spreading of infection, and for purifying any ship or house in case any contagious disorder shall manifest itself in any part of the United Kingdom, notwithstanding the precautions taken to guard against the introduction thereof, and to communicate the same to all magistrates, medical persons, and others His Majesty's subjects who may be desirous and may apply to be made acquainted with the same." Those regulations were published in the "London Gazette," Whitehall, in May 1805. Then he goes on to say, "While we defend ourselves against the introduction of pestilential diseases from the Mediterranean, or of the yellow fever from America, we supinely preserve among us a contagious distemper, originally exotic, which has been destructive beyond all others for more than a thousand years past. I have stated in another work the various means by which contagion is communicated, and have shown how rapidly the small-pox, scarlet fever, and measles are diffused through populous towns and how often they extend from thence to distant parts of the country. Those who attend to the particulars of the statement, will, I think, acknowledge that these contagious febrile disorders might be suppressed by municipal or parochial regulations, without much difficulty and without any material injury to individuals. The necessity of some general plan for extirpating the small-pox from our island, and for preventing the future introduction of it, does not seem to be superseded by the new



"inoculation." This subject was not taken up in England only; some of the points upon which Haygarth laid stress with reference to isolation, and so on, were taken up abroad.

10,897. (*Chairman.*) I do not understand how it can be at all material to our inquiry how far Haygarth's method may have been taken up abroad?—Except for the mere interest of the matter, I do not know that it could, with this exception—it is a point which is occasionally omitted in regard to the diminution of small-pox in Sweden—I do not know whether that has been brought forward or not. There is a report concerning the state of vaccination in Sweden, which refers to the introduction of vaccination in 1803, and simultaneously with that introduction we find that there was a regulation made for the metropolis "imposing a fine of three dollars on anyone who should fail to announce to the medical officer of the district the appearance of the contagion of the small-pox; and in every such case the person infected was to be carried to the small-pox hospital" (Monro, page 125).

10,898. Does that conclude what you have to say with reference to its acceptance in England?—It does.

10,899. Is there any evidence that you have been able to find showing that to any material extent notification and isolation were practised in England down to the time of vaccination, seeing that at Chester, as a system, it had ceased apparently some time before?—As a system it had ceased, but the principles were adopted by the profession and recommended, and the public had been taught to avoid small-pox in this way; that I think is a very material factor in the diminution of natural small-pox towards the end of the last century.

10,900. But you have no evidence to show over what area it prevailed?—Not as to the extent of the area.

10,901. Is there anything to show that it was taken up in London at all?—Not as a system, I think.

10,902. (*Sir James Paget.*) Does not Haygarth himself say that the people everywhere preferred that their children should be exposed to small-pox and have it?—That was so before his time.

10,903. Is that discontinued?—Yes, and I read a quotation showing that his teaching had such an effect that children with small-pox were not allowed to play about upon the walks, and those scenes were not again seen even when his system was suspended.

10,904. That was the case at Chester, but elsewhere the custom prevailed that children were allowed to associate together?—That was so; but, the clergy were very active in promulgating Haygarth's teachings.

10,905. Do you think that affected the people of England?—They were endeavouring to get this carried out. We have instances related in which they claimed that they stamped out epidemics, and if they carried on the same system throughout the country it would have a very material effect indeed upon the spread of the disease.

10,906. Is there any evidence that they did?—There is only the evidence of the clergy that they did carry it out in the country.

10,907. In London is there any probability that they did?—I do not recollect any evidence as to that in London.

10,908. (*Sir William Savory.*) Did you say that there was a statement that they stamped out the epidemic by isolation?—They did not use the words "stamp out," because that is a word of recent introduction, but they say they stayed the epidemic which they had feared, you will find that in letters in the appendix to Haygarth's work published in 1793.

10,909. Had you not better produce them?—I have produced an abstract of one of them.

10,910. (*Professor Michael Foster.*) In one of those letters Dr. Haygarth himself says: "So far as I know neither in that—that is Dumfries—nor in any other part of Great Britain, except Chester, had any regulations been attempted to exclude casual small-pox"—Quite so; his regulations were not carried out, but his teachings were.

10,911. (*Sir James Paget.*) With reference to his teachings, he would have carried out the same teaching with reference to all fevers—his second book is with reference to fevers, is it not?—No; the title of that is, "A Plan to exterminate Small-Pox."

10,912. However, it plainly relates to the extinction of fever by isolation; is there any evidence that his

teaching produced any regulation or any custom with regard to the extinction of either scarlet fever or measles by isolation?—His original system was only for small-pox, and then in his work in 1793 he is anxious to combat small-pox by legislation. I was going to read the preface to his work, but I see I have not got it here. I do not recollect that when he recommends the appointment of inspectors and surveyors in the counties and so on, they were to report upon anything but small-pox.

10,913. In his later work he extended it to fevers, did he not, of various kinds?—In a later work, in 1801, entitled "A letter to Dr. Percival," he extended it to fevers, and so did Willan.

10,914. (*Dr. Collins.*) I understood you were making some quotations from Mead and others to indicate the growth of what might be called the knowledge of public hygienic or sanitary science during the latter half of the last century; is that so?—Yes.

10,915. You would probably agree with Dr. Guy in his paper where he states that "doubtless in the 18th century there were influences at work tending strongly to counteract any injurious influence which inoculation may be presumed to have exerted by spreading the disease which it mitigated"?—I should.

10,916. He points there more particularly to the sanitary work in prisons effected by Howard and others, does he not?—Yes, and also the sanitary condition of London.

10,917. And also as to some improvements, not easy to find, in the sanitary condition of our population?—Yes; if I might be allowed to read a short statement from Dr. Black which bears upon that point, he says (pages 159–60), writing in 1780; "London streets are now widened, the inhabitants live less crowded together, the houses stand upon double or treble the ground which they formerly occupied, ventilation is freer, the city is more plentifully supplied with water and fuel, both extremely necessary in preserving health, in preventing sickness and infectious fevers originating from foul stagnant air, filth and uncleanness; the streets and foot paths are better paved; sewers and drains are made to carry off moisture and corruption; there are many more country houses and agreeable outlets, if not in the same county in the vicinity of London, where families and children may enjoy fresh air and exercise; the high roads round the capital and throughout the kingdom are greatly improved, and invite more to exercise." (See Question 11,000.)

10,918. Along with the growth of knowledge of hygienic and sanitary science there was a knowledge of the avoidability and limitability of small-pox?—There was.

10,919. (*Professor Michael Foster.*) Do I understand you to say there was no attempt to carry out Haygarth's plan anywhere after the cessation of the Chester plan?—I do not recollect that there was any plan for actually carrying out a system of isolation by rewards; but I maintain that a system of isolation was carried out informally very considerably; you must distinguish between his teaching and his plan.

10,920. So far as it goes, what you are reading extracts from, shows that his teaching was approved of; what I asked you before was whether his plan was carried out?—No, because his regulations, as his Lordship said, would require legislation, and that legislation was not forthcoming.

10,921. Not his Chester regulations?—No, not his Chester regulations, but his 1793 regulations. His plan for rewards to the citizens of Chester did not require legislation.

10,922. But surely his system in Chester was suspended soon after its publication?—Yes.

10,923. And carried out nowhere else?—He gives instances of the clergy—.

10,924. But I refer to his system?—His system as a system was not carried out anywhere except Chester.

10,925. I do not know whether we are quite agreed why the plan was given up at Chester, did I understand you to say that you thought it was due to a deficiency in the subscriptions?—I said it might be. (See Question 11,013.)

10,926. He says, "This suspension was occasioned neither by any medical difficulty nor by a deficiency in the voluntary subscriptions, but solely by the

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"ignorance and delusion of the populace. Our plan was to propose gratuitous inoculation to the children of our poor fellow citizens every second year. At the close of the third period, when this favour was humANELY offered to them, it was universally rejected." (Haygarth 1793, page 481.) That is to say, the system at Chester fell to the ground, because the people, being an ignorant and deluded populace, refused that inoculation which you say was not a part of his system?—Are you quoting from Haygarth?

10,927. I am quoting from his letter to the authorities at Geneva. I am quoting from page 481 of the edition, "Sketch of a Plan to exterminate the Casual Small-pox" in 1793; it is contained in a letter written by Haygarth himself?—Is not that a quotation from Mr. Falconer's report?

10,928. This is written by Haygarth himself and is a statement in his letter to the Syndicate or Council of Health of the city of Geneva?—I thought so; that refers to *inoculation*.

10,929. That is given as his reason for the suspension of the plan?—I have gone very carefully into that point and discovered how it was that the inoculation plan was given up.

10,930. (*Chairman*.) But it comes to this that when he found that the inoculation part of the general plan could not be carried out because people would not take advantage of it, then the rest of the plan was not thought worth keeping by itself; so the whole plan fell through?—Not at all; he did go on with the Rules of Prevention in spite of their refusal to accept gratuitous inoculation.

10,931. (*Professor Michael Foster*.) What does his own statement mean, but that they could not carry out the plan, and therefore the plan fell through?—That means the plan of general inoculation.

10,932. He is quoting the proceedings of the society?—Of which Mr. Falconer was chairman, and that relates to inoculation which was a subsidiary part of his scheme.

10,933. Do you mean to say that the proceedings he is speaking of there do not refer at all to isolation?—You cannot interpret that to mean that the system as a whole was given up, because it was not the fact. (*See Question 11,013.*)

10,934. (*Chairman*.) What evidence have you that his system continued in force in Chester after 1792?—Gratuitous inoculation was opposed in 1776, and they went on refusing it, as I stated in evidence, until 1781, and yet in that period, as I also showed you in evidence, they had reduced the small-pox patients in Chester to two or three patients by the Rules of Prevention; they went on with the Rules of Prevention and paid the rewards.

10,935. Then they stopped; and the question is why they stopped. Whether they stopped because they came to the conclusion that whatever good might be done it was not worth continuing the system when they could not get inoculation with it—that is the question. Upon that the paragraph cited by Professor Foster seems to bear, because he says the reason why the Small-pox Society was given up was because the people would not accept inoculation. Haygarth writes this in 1792. Now according to you, for many years before then the proceedings of the Small-pox Society had chiefly consisted in isolation?—Quite so.

10,936. Why should its proceedings be given up in 1792, or about that date, because the people would not accept the inoculation unless it was that they thought that without the inoculation it was not worth carrying on the system; that is exactly what it suggests, is it not?—I do not think so. It is quite possible that when they suspended the Rules of Prevention the reason was that small-pox had ceased; he says the ultimate result of carrying out the rules of prevention was that even without inoculation there were no cases. I think, if I may be allowed, I may make it quite clear as I have read the work again. First of all with reference to the proceedings of the Small-pox Society; now at the last meeting of the Commission Professor Foster referred to those proceedings as though Haygarth had written them; now they are not written by Haygarth, but they are published in Haygarth's book and signed by the chairman, Mr. Falconer.

10,937. (*Professor Michael Foster*.) Do you maintain that that society was not his society in the sense that he got it up?—You say in Question 10,744: "The name

"of his society was 'The Society for Promoting Inoculation at Stated Periods.' He says inoculation at proper intervals was from the first made a part of the benevolent institution."

10,938. (*Chairman*.) The proceedings of the Small-pox Society were according to you chiefly proceedings relating to isolation, were they not?—You must distinguish between the two; this society was founded before these rules of prevention were instituted.

10,939. Was there more than one Small-pox Society at Chester?—No, there was only one.

10,940. That Small-pox Society during the latter period of its existence, I understand from you, chiefly occupied itself with isolation, and but little with inoculation?—That was so.

10,941. In 1792 Haygarth writes that the proceedings of that Small-pox Society, which according to you during its latter years, at all events, chiefly occupied itself with isolation and not inoculation, were suspended by the ignorance and delusion of the population, which he goes on to explain related to their being unwilling to take inoculation; does not that seem to show that if they were suspended on that account they were suspended because of the view that isolation without inoculation was not worth keeping the society up for?—That is your inference.

10,942. Is it not the natural inference from what Haygarth himself says; that is why as, he tells us, the proceedings of the society were suspended. Why should it have been a reason for suspending them if those who were carrying on the society thought that isolation without inoculation was an object worth continuing it for?—I see your meaning.

10,943. (*Dr. Collins*.) He claims that they were carrying on his plan at Boston where they discouraged inoculation?—Quite so; he also claims that in spite of his system being suspended the effect of his teachings remained.

10,944. (*Dr. Bristowe*.) I suppose all would admit that there is value in isolation?—No doubt.

10,945. (*Professor Michael Foster*.) Haygarth himself was of opinion that vaccination instead of replacing his system might appropriately have been made a part of it?—Yes; but still Haygarth's name practically drops out of literature. I am referring in my book to the time from that period till now. I believe that even Sir John Simon in his "English Sanitary Institutions" makes no mention of Haygarth's name whatever, although I venture to look upon him as one of the greatest sanitarians of the last century.

10,946. (*Chairman*.) I ought to have put this to you, whether that passage would not lead to the conclusion, not that isolation without inoculation was not worth keeping up the society for, but that such isolation as they were able to secure was not worth keeping up the society for without inoculation?—I understand the distinction, but I think I should take exception to the latter view because I have read so many extracts where Haygarth recommends isolation in spite of their being unable to inoculate. (*See Question 11,006.*)

(*Chairman*.) You do not agree that that is the proper conclusion, but I merely wish to put right the inference which was suggested to you.

10,947. (*Sir William Savory*.) In your view what became of that society if its operation did not cease at the date this was written?—This Chester Society of Haygarth's was superseded by a much more extensive plan, a plan to be applied to the whole country. This plan was dedicated to the King, and appears, so far as I can gather, to have been under consideration; but the whole thing fell to the ground because cow-pox was advocated as an everlasting security against small-pox.

10,948. When did it fall to the ground?—I think the last reference is the letter that Professor Foster quoted. (*See Question 11,010.*)

10,949. (*Chairman*.) No, that was published in 1792; whereas we hear of it in 1793?—You may say at all events that, giving it a few years to live, the system as a system died out a few years after 1798.

10,950. (*Sir William Savory*.) Could you show us any evidence of the result produced by it?—Only the evidence I have already put in and Haygarth's claim that the effect of his teachings and of this system being carried out informally was of value.



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10,951. That is what might happen; there is no evidence of what did happen?—I can give no more evidence as to that.

10,952. So the whole thing is obscure; there is a suggestion from Haygarth that certain plans might lead to certain results, but beyond that there is no evidence?—Haygarth's system did lead to good results, and we find the subject is again brought up in 1799.

10,953. (*Dr. Collins.*) I understand you to say that although Haygarth had taught the lesson, at all events his plan was not carried out anywhere in London?—I have no recollection of any evidence of its being carried out here.

10,954. What is the date of the Small-pox Hospital being founded in London?—1746.

10,955. Do you happen to know whether part of the object of the hospital which was originally founded to promote inoculation was to receive within its doors cases of natural small-pox for treatment?—That is so.

10,956. Was not that the first instance of which we have any record in London of an attempt to isolate cases of infectious disease?—I believe it was.

10,957. (*Dr. Bristowe.*) What was the object of founding the hospital; isolation or treatment?—In 1746, it would be difficult to say; it may have been both for isolation and treatment; but if it was intended only for treatment it was, of course, a means of isolation; at any rate, Haygarth himself was very strong upon the isolation of cases, either in pest-houses or in certain wards of the hospital; and there is no doubt that that part of his scheme was and had been carried out in London and elsewhere; but the regulations as to the appointment of overseers and the payment of rewards were allowed to drop. (*See Question 11,015.*)

10,958. (*Sir William Savory.*) But it may have been a question of degree; people have always been afraid of the disease and kept out of the way of it as much as possible?—No, not before the last quarter of the last century; they were anxious to have it then. I gave instances of that, it was what Haygarth laid particular stress upon; the poor people looked upon small-pox as a necessity, and therefore did not take the trouble to keep out of the way of it; they tried to catch it in some cases.

10,959. But the majority of the small-pox patients would naturally have avoided it if they could?—I think that to a great extent they looked upon it as people used to look upon measles, as a thing you must have, and that you had better get it over.

10,960. Do not people now try to avoid measles?—They do at the present day.

10,961. (*Mr. Meadows White.*) Do not you think that medical men would suggest to patients and their families that too great contact should not be allowed with small-pox patients in those days?—No, not before Haygarth's time. I think it is clearly established by the literature of the subject that until Haygarth's time—

10,962. (*Professor Michael Foster.*) That they did not recognise the infection of small-pox?—No; I do not say that. I must ask you to read the evidence given at the last meeting. I laid special stress upon the period before Haygarth's time, and what was generally thought then by poor people, they looked upon small-pox as a visitation from God; in fact, it was a new thing to them to hear that it was a disease which they could avoid.

10,963. Before 1784?—Haygarth begins in 1776.

10,964. You read to us that Maitland came to the conclusion that inoculated small-pox was infectious; do you think that people then knowing that small-pox was infectious did not take steps to escape from the infection?—Haygarth distinctly states the opposite.

10,964a. (*Professor Michael Foster.*) What Haygarth states is that owing to inoculation small-pox had become so mild that people did not take the same steps to avoid it as they did before; there is a paragraph you will find in Haygarth's book to that effect?—No.

10,965. (*Mr. Meadows White.*) I think you suggested a passage from Dimsdale, that Dimsdale did caution the inoculated patients?—Yes. If you will allow, me I will give you the reference to Haygarth at the next meeting of the Commission. (*See Question 11,027.*)

10,966. The question I put just now referred rather to the probable practice of medical practitioners attending families, do not you think that they would caution the family against the danger of contagion if it were not already known to them?—It is reasonable to suppose

that they would, yet you must remember that poor people would not follow the instructions the medical men gave them; and Haygarth took so much trouble in Chester because he said the poor people would expose themselves; they were anxious to get it.

10,967. (*Professor Michael Foster.*) I wish to call your attention to this passage from Haygarth in the introduction to his book published in 1793, page 37: "Before inoculation was known, a gentleman's family liable to the distemper was held in continual terror on its visitation; watched its approach into the neighbourhood with careful solicitude; took early, and often successful measures to prevent its introduction into the village or town which was situated in or near the place of their residence. These exertions, by checking the progress of the pestilence in numerous districts, would frequently prevent its communication into larger towns, and thus diminish its fatality among the inhabitants. But at this time, and in this neighbourhood, all who dread the distemper are inoculated; whence the community are wholly deprived of the benefit of these salutary precautions." That is to say, being inoculated they are careless?—That was so in the instance of a gentleman's family, no doubt; and Haygarth used it as an argument in favour of his plan. There are other instances given, especially when it was a mild small-pox; the poor people were perfectly callous. They could hardly persuade poor people to keep away from it; they were "anxious," the expression is, to have their children infected; Jenner and Adams mention epidemics of small-pox of such a mild character that the people not only did not desire to avoid it, but were particularly anxious to catch it.

10,968. (*Chairman.*) What is the next point to which you wish to direct the attention of the Commission?—I wish to direct attention to certain diseases of animals and the regulations which have been effectual in getting rid of them. I may first of all briefly refer to the cattle plague. This disease was introduced into England in 1865, and when it was introduced the London dairymen and others used no method whatever to prevent the extension of the disease; it raged unchecked. An Order in Council was ultimately passed directing dairymen and others to report outbreaks of any contagious or infectious disease among the animals under their charge. A Veterinary Department was founded in 1865, and inspectors were appointed in various parts of the country; but their duties were limited then to merely reporting outbreaks. The introduction of cattle plague into Great Britain in 1865 led to much-needed legislation. A short Act was passed in July 1865 and another in January 1866 having reference to contagious diseases of animals. That was not exactly the origin of the stamping out system, but it was the first time the stamping out system was brought to the notice of the public; there was violent opposition to it; but it was adopted; and the result of that system, which consisted in slaughtering the diseased animals and reporting all cases, is shown in this diagram from the Report of the Veterinary Department for 1872, which I have here. You have here represented the epidemic of cattle plague, the number of cases being sometimes 18,000 weekly, that is, the total number attacked. Then you have the introduction of the stamping out system and the rapid decline of the disease.

10,969. The method of stamping out the cattle disease would be hardly applicable to human beings?—Unfortunately it would not as regards slaughter; but I want to trace the gradual growth of the stamping out system. I shall have occasion to show that the stamping out system does not always mean slaughter, though that is the most perfect form of isolation, of course. The disease was introduced again in 1877; there was also an outbreak in Hull in the same year, and since the outbreak of the cattle plague in Hull this country has remained perfectly free from this disease. Then I should like to direct the attention of the Commission to sheep-pox. This is a disease which very closely resembles small-pox. It has been introduced into this country on several occasions; it was introduced in 1847, again in 1862; in 1865 it was introduced again, and "active measures of repression were at once taken; the diseased flocks were carefully isolated, and day by day as fresh cases occurred the diseased animals were killed and buried. Owing to the adoption of these precautionary measures the affection did not extend beyond the flock among which it first appeared." (Veterinary Department Report, 1872, Appendix, page 22). Then it was introduced again in 1866 at Long Buckley, in Northamptonshire. In this case the disease was exterminated



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"by the slaughter and burial of the whole flock, and immediate application of disinfectants to the hurdles and other things with which the sheep had been in contact" (*ibid.*). Then it was introduced again in Cheshire, and strict isolation was enforced in both places and the infection died out. Since 1866 we have had no outbreak of sheep-pox in this kingdom, but foreign sheep have been landed with sheep-pox in 1868, 1869, 1870, 1871, 1875, 1876, 1878, and 1880, but the disease has been prevented from spreading. Then I should like to direct the attention of the Commission also to the subject of foot-and-mouth disease. This disease was introduced in 1839. This disease also has been dealt with by the stamping out system, although in this case it is very much more difficult because of the very short period of incubation, and the value of the stamping out method very greatly depends upon the length of the incubation period. Foot-and-mouth disease very often, from infection to recovery, does not exceed 10 days; yet in the Report of the Agricultural Department for 1884, page 10, that is to say, the Board of Agriculture now, I read, "When foot-and-mouth disease exists in a manageable state, perfect isolation and effectual disinfection have proved equal to the complete control of the spreading of the infection, and the final extinction of the disease; nothing more is necessary in any case than to close up all the channels through which infected matter can be conveyed, but in order that this may be done close supervision by conscientious and responsible officers is required; without it the case is hopeless." I was anxious to draw attention to the stamping out system, and the way that it has been rendered effectual in this country, especially with reference to cattle plague, sheep-pox, and foot-and-mouth disease, showing that although inoculation can be performed, yet in this country civil regulations are considered to be far superior to any system of protective inoculation in those cases.

10,970. (*Sir James Paget.*) Is there any case of isolation being effectual besides the one you have quoted?—I have quoted more than one in which isolation without slaughter was effectual.

10,971. But the animals to which your first quotation applied were all slaughtered?—In cattle plague it was always slaughter, in sheep-pox it was slaughter sometimes; but not so in foot-and-mouth disease.

10,972. Then foot-and-mouth disease is the only one in which isolation has at present been found effectual, is it not?—I think in sheep-pox also. "In all cases the greatest care was taken to prevent the movement of sheep out of the infected districts, or the introduction of healthy animals into it, and the affection finally died out without producing any great amount of mischief" (Veterinary Department Report, 1872, Appendix 22). I think that as a matter of fact they would now always slaughter sheep, because the value of the carcase is not a very great consideration, and the isolation is then complete.

10,973. (*Chairman.*) Foot-and-mouth disease has not been absolutely stamped out, has it?—Yes, certainly, foot-and-mouth disease in this country has been stamped out.

10,974. I thought I saw occasionally mention of it?—No, you have heard of cases landed at ports, and then it was promptly dealt with. In that case they would slaughter the animal; but supposing foot-and-mouth disease broke out in a very valuable herd of pedigree cattle they would treat it by isolation.

10,975. (*Sir James Paget.*) One wants to know the extent to which isolation can prevent the spreading of any one of these diseases amongst sheep or cattle. No one can doubt the value of isolation, but how far is it so completely sufficient as not to require slaughter in any of those cases?—In foot-and-mouth disease it has been effectually carried out without slaughter.

10,976. But not in the other diseases?—Not in the other diseases, because it is simply a question of the value of the carcase and the chances of recovery. In cattle plague the chances of recovery are so extremely small that it is an infinitely better policy to slaughter the animal at once.

10,977. Has isolation ever been tried in cattle plague?—It has not been tried; they slaughter at once.

10,978. (*Dr. Collins.*) Can you tell me whether isolation without slaughter has been tried in sheep small-pox and cattle plague, and failed?—No; for I am not aware of its having been tried in cattle plague at all, for the reason I have given.

10,979. (*Chairman.*) Isolation has not been successful in getting rid of pleuro-pneumonia, has it, even isolation with slaughter?—The regulations have not been in force yet. The Board of Agriculture have only recently adopted the system.

10,980. But that was the system before that which has just been adopted, was not it?—It was not carried out because there was a great tendency to resort to inoculation; farmers avoided slaughter as much as possible; there was no compensation. It is the best system for pleuro-pneumonia, though, as a matter of fact, pleuro-pneumonia does not lend itself to the stamping out system so well as an eruptive disease, such as sheep-pox or foot-and-mouth disease.

10,981. Has inoculation been tried for stamping out small-pox in sheep?—It has been tried in France, but it has been condemned.

10,982. Was it condemned because it was found that sheep small-pox followed after inoculation?—Yes, it spread the disease; there is just the same objection to partial inoculation in sheep small-pox as there is to the partial inoculation of small-pox in man.

10,983. (*Sir William Savory.*) What influence or conclusion is to be drawn from these facts you put forward with reference to cattle?—That will appear in my next statement.

10,984. (*Chairman.*) What is your next statement?—The stamping out system as applied to human small-pox. I should like to draw the attention of the Commission to this subject by reading the opinion that was expressed by Sir James Simpson. Sir James Simpson read a paper in 1868, and that was why I gave an account of the cattle plague and the meaning of the stamping out system. I thought possibly some of the lay members of the Commission might not be acquainted with the term. Sir James Simpson brought this same subject before the notice of the profession in 1868.

"Proposal to stamp out Small-pox, and other contagious Diseases, by Sir J. Y. Simpson, Bart., M.D., D.C.L. Edinburgh, Edmonston and Douglas, 1868.

"The public mind has during the last two or three years become familiarised with the idea of stamping out a disease in the instance of rinderpest, a malady apparently spreading in this country, as small-pox does, by contagion only, and everyone well knows the perfect success with which this affection has been lately banished out of England, while it has also, by due care, been prevented spreading to Ireland and the Isle of Man. I believe the same principle of stamping out could be as successfully applied to the extirpation of small-pox among us as it has been applied to the extirpation of rinderpest, but of course with great differences. The rinderpest has been stamped out by killing all the animals labouring under the disease, and in many instances all those animals of the same flock which had been exposed to the contagion of it, but which were not yet attacked by the malady. The mission, however, of the human physician is ever to save life, never to destroy it. And yet in accordance with this leading and divine principle, we could, in my opinion, as surely and as swiftly stamp out small-pox as rinderpest has been stamped out. For all that appears necessary for the purpose is simply the methodic temporary seclusion, segregation, or quarantine of those affected with small-pox, until they have completely passed through the disease and lost the power of infecting and injuring others. The pole-axe was the chief and leading measure required to stamp out rinderpest. *Isolation is the chief and leading measure required to stamp out small-pox.*"

"Various rules and arrangements would be necessary to effect the requisite amount of isolation. Without at all entering into details, let me here observe that the following measures would perhaps form the chief points to be attended to in the way of regulations.

"1st. The earliest possible notification of the disease after it has once broken out upon any individual or individuals.

"2nd. The seclusion, at home, or in hospital, of those affected, during the whole progress of the disease, as well as during the convalescence from it, or until all power of infecting others is past.

"3rd. The surrounding of the sick with nurses and attendants who are themselves non-conductors or incapable of being affected, inasmuch



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" as they are known to be protected against the disease by having already passed through cow-pox or small-pox.

" 4th. The due purification during and after the disease, by water, chlorine, carbolic acid, sulphurous acid, &c., of the rooms, beds, clothes, &c., used by the sick and their attendants, and the disinfection of their own persons.

" Here, as elsewhere, to obtain a great public good some private or individual inconvenience must, for the time, be undergone by those who unfortunately become the subjects of the disease. But since first publicly speaking of the stamping out of small-pox I find that in 1867 the Legislature has passed the 'Public Health Act' of Scotland, a most excellent measure, which gives some of the leading powers required to enforce a series of regulations like the preceding. The Sanitary Act of 1866 for England and Ireland tends in the same direction, but is not so comprehensive. For the 'general prevention and mitigation' of infectious diseases and other purposes, the Scottish Act has erected a number of Local Boards everywhere throughout Scotland, consisting, according to circumstances, of the Town Councils, of the Police Commissioners, or of the Parochial Boards. These local authorities are each entrusted with the power of appointing sanitary inspectors and medical officers under them, and are themselves so far under the central control and advise the 'Board of Supervision.' They are bound to provide district hospitals or temporary places for the reception of the sick, to remove to them, by suitable carriages, any person suffering from contagious or infectious disorders; in case of need to direct not the sick to be removed but to remove all other unaffected persons surrounding them, providing suitable accommodation for those unaffected elsewhere; and to have in each district all necessary apparatus and attendants for the disinfection of woollen and other articles, clothing or bedding, which may have become dangerous from contact with diseased individuals. Such powers are of the highest importance for the protection of the general community against small-pox and other such infectious diseases among the poorer classes of the population; but regulations in the same spirit would equally benefit the highest and richest in the land, both individually and collectively, and the sick as well as the uninfected; the necessary amount of isolation of the sick being, of course, allowed to all who wished it, and could afford it, to be effected at their own homes.

" The Legislature has no scruple in interfering in some other diseases to as great or, indeed, to a greater extent. It enforces, for instance, the isolation of any individual affected with insanity, be he rich or poor, who is a homicidal lunatic, endangering the lives of others. If by a law which no one thinks harsh or severe lunatics are prevented from destroying the lives of their fellow men, why should it be thought harsh or severe that people affected with small-pox should be prevented from dealing out destruction and death to all the susceptible with whom they happen to come in contact? Homicidal lunatics do not destroy annually in Great Britain above eight or ten on an average of their fellow men. Small-pox patients yearly destroy, on the contrary, hundreds, instead of units, of their fellow men in this island. Sixty years ago, when speaking in the House of Commons of the gross iniquity of inoculating with small-pox the out-patients of a London hospital and then allowing these inoculated persons to infect others with the disease, Mr. Sturges Bourne strongly, but truly, remarked, 'I think that the Legislature would be as much justified in taking a measure to prevent this evil by restraint as a man would be in snatching a firebrand out of the hands of a maniac just as he was going to set fire to a city.' A rattlesnake or a tiger escaping from a travelling menagerie into a school full of children would, in all probability, not wound and kill nearly so many of these children as would a boy or girl coming among them infected with, or still imperfectly recovered from, small-pox, or scarlet fever, or measles, or whooping-cough. Most probably the cobra and the tiger, because they are always dangerous, are always, as far as possible, prohibited from making such visitations; and the infected boy or girl should be prohibited also during the time that they are dangerous by running through the course and convalescence of such contagious diseases; or, in other words, while they exhale from their bodies a virus of disastrous and deadly potency.

" The great object of preventing the diffusion of small-pox in any city, or village, or hamlet by the stamping-out measures which I have ventured to suggest in this communication would consist, of course, chiefly, when practicable, in isolating the very first cases. Some time ago a professional friend to whom I was explaining these views objected to them, that in the case of the town of Leith, which was the habitat of small-pox in 1861 and 1862, the disease was at one time too diffused to apply them. Dr. Paterson, of Leith, however, has kindly informed me that at the time of the visitation of the malady he made an official inquiry into its origin, and found it to be this:—A beggar woman, on tramp from Newcastle, brought in the course of her wanderings to Leith a child lately affected with small-pox, and with the crusts of the eruption upon it. In Leith she became an inmate of a lodging-house in a 'land' or block of buildings full of lodgings for the poorest of the poor. Many of the lodgers in these other houses, with their children, visited the room where the woman and the sick child resided. By the time Dr. Paterson was requested by the magistrates to inspect the tenement several persons were already dead of small-pox caught from this imported case. One man, who had already in previous life suffered from two attacks of small-pox, visited the infected tenement and sickened and died of a third attack of the malady. The disease soon spread to other parts of Leith, and, as I am informed by the registrar of that town, 99 human beings were destroyed by it, and much suffering and sickness produced among the many hundreds in the town who caught the disorder and recovered. But if that first case or cases had been obliged to be reported on at once, and had been forthwith isolated in the hospital or elsewhere, all this unnecessary amount of human mortality and disease would have been avoided; nor would the isolation and maintenance of the first case, or of the first 10 or 20 cases, have cost as much money as the purchase of the coffins for the 99 who died. The blowing up of the powder magazine in the fort at Leith would not likely produce nearly so much danger and destruction of life among the inhabitants of Leith as the advent of the beggar woman and her infected child. Yet how carefully do we guard against the one danger, and how carelessly do we treat the other.

" In 1818–19 above 3,000 individuals were attacked with small-pox in Norwich, or about a thirteenth part of the whole population of that city. Of those attacked 530 died. The disease was originally introduced into the town, according to Mr. Cross, by a girl who, in travelling with her parents from York to Norwich, was exposed to small-pox at a market town in the course of her journey; and the malady appeared on her as soon as she arrived at Norwich. This was in June 1818. In January 1819 a druggist gave a new impulse to the contagion by inoculating three children with the small-pox. The disease destroyed in Norwich, according to Mr. Cross, more human life in the same space of time than had ever taken place from any other cause than the plague. The isolation of the girl first affected, and the prevention of the artificial inoculation of the three children by the druggist, would have prevented all this frightful mortality. To inoculate anyone nowadays artificially with small-pox, as the druggist did, has for many years been established by Act of Parliament as a crime, inasmuch as it tends to imperil the destruction and death of others. Should it not be equally regarded as a crime for a community to allow of a case in their midst (such as that of the girl first affected at Norwich) to remain in circumstances allowing of the deliberate dissemination and unchecked spread of the disease from her to others?

" In order to stamp out small-pox, the first of the four regulations which I have ventured to lay down, as to the earliest possible notification of the presence of the disease, is indispensably essential. The 'Public Health Act' for Scotland enacts that the keeper of any common lodging-house shall, when any of its inmates are ill of fever, or of any infectious disease, 'give immediate notice thereof,' either to the medical officer or the inspector of the poor, or the inspector of lodging-houses, in order that the medical officer shall forthwith visit and report on the case, and due means of prevention be taken by the 'local authorities.'

" It would surely not be reckoned too hard a measure for the public safety that every householder should,



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" by himself or through his medical attendant, be  
" obligated by the Legislature to report upon the ex-  
" istence of any case of small-pox that might appear in  
" his establishment. In the same spirit every medical  
" practitioner might be bound to report immediately  
" any example of the disease that he met with in prac-  
" tice, all, or almost all, cases of small-pox could thus  
" be brought under official notice comparatively early  
" in the progress of the malady. As the disease does  
" not mature into the stage of infection for some days  
" after the eruption shows itself, a free period would  
" thus be secured for arranging proper measures of  
" isolation, either at home or in hospital, before the  
" date and danger of infection were reached. Further,  
" with the view of preventing the infection by others  
" by patients that have passed through small-pox or  
" its perils, it will ever be a matter of importance to  
" prohibit and prevent the possibility of infecting  
" others till the power of infection is exhausted. Small-  
" pox patients have apparently the power of dealing  
" out the disease to others, as long as any parts of the  
" incrustation of the eruption are left on their faces,  
" hands, or body, and until that time, and it may be a  
" few days longer, segregation from the susceptible is  
" necessary; and no doubt would be followed by every  
" person of proper feeling; for who would inflict or run  
" the chance of inflicting disease and death upon his  
" fellow beings? If he gives the infection even to one in-  
" dividual only, from that individual it may possibly  
" become multiplied and propagated to hundreds. And  
" before mixing again in society the persons of the sick  
" as well as of the attendants should perhaps, as  
" already suggested, be subjected to bathing and some  
" systematised disinfection. Like other physicians, I  
" have heard of various cases of small-pox and other  
" infectious diseases propagated from the sick at an  
" advanced period of their own convalescence. Several  
" instances have been communicated to me of beggars  
" in the streets of Edinburgh and elsewhere importuning  
" for charity by lifting up their children, with small-  
" pox incrustations still upon them, almost against the  
" very faces of those from whom they asked alms, and  
" infecting with the malady those whom they subjected  
" to this outrage. Not long ago a woman, as I am  
" informed by Professor Gairdner, with her face and  
" hands incrustated with small-pox, was selling sweetmeats  
" to the children of a school in Glasgow. I have heard  
" of repeated instances of small-pox obtained by riding  
" in public carriages which had been employed imme-  
" diately before by persons still in the stage of conva-  
" lesence from the malady. The Sanitary Acts of  
" England, Scotland, and Ireland ought in a great  
" measure to protect the lieges against such abuses for  
" the future, as they forbid, under a penalty, any per-  
" sons suffering from infectious disorders (as small-pox,  
" whooping cough, &c.) from entering a public convey-  
" ance or wilfully exposing themselves in any street or  
" public place, or being exposed by others in any street  
" or public place without proper precautions against  
" spreading the disease.

" The late stamping out of rinderpest proved a most  
" successful but, at the same time, a most expensive  
" proceeding. The disease and the poleaxe as a means  
" of extirpating it has, I am informed, cost cattle  
" proprietors and the country, in the price of the animals  
" destroyed, a sum of about 2,000,000*l.* sterling. To  
" stamp out small-pox from amongst us, and thus save  
" annually hundreds and thousands of human lives by  
" its extirpation would require no such sum as was  
" expended in the extinction of the cattle disease and in-  
" deed would require little or truly no outlay beyond what  
" the Legislature has already enacted and exacts for  
" the protection of the public health; for, as previously  
" stated, much of the machinery for its extirpation  
" already exists under the late Sanitary Acts of Great  
" Britain and Ireland. The segregation of those affected  
" with small-pox who belong to classes which are able  
" to keep the sick member or members of their family  
" at home would, of course, cost the country nothing;  
" while the rules applicable to their isolation could, if  
" faithfully followed, be managed without any special  
" inconvenience or any injury to their feelings; and  
" generally, if not always, under the superintendence  
" and responsibility of their own medical attendants.  
" These regulations would involve no restrictions that  
" are not followed out at present in every well-regulated  
" family when infectious disease attacks any of its  
" members; none indeed, except such as common  
" prudence and common humanity demand for the  
" protection of the bodies and lives of those that are  
" still happily unaffected. Any open breach of rules

" that tended deliberately to spread the disease and  
" endanger and destroy the health and lives of others,  
" would of course require to be repressed by proper  
" penalties. The primary separation and the mainte-  
" nance of the poorer classes under the circumstances  
" is already provided for under the Sanitary Acts; and  
" our present sanitary laws are, in relation to the poorer  
" classes, defective in their powers of stamping out  
" infectious diseases, merely and mainly in as far as  
" they do not enforce the isolation of the sick by due  
" cautions after they are lodged in hospitals or in houses  
" for their reception.

" In the eye of the political economist and of the  
" philanthropist, the premature slaughter annually of  
" three or four thousand, or even of three or four  
" hundred human beings is a loss that cannot be  
" easily estimated by mere yellow gold.

" The measures which I have suggested would prob-  
" ably, in my opinion, stamp out small-pox in Great  
" Britain within six months or a year, provided they  
" were carried out as faithfully and universally as the  
" Legislature can command, and if the extirpation of  
" the disease were thus once effected, any fatal case or  
" cases of the return of the malady to any seaport, city,  
" town, village, or country district, would be speedily  
" notified by a machinery already in full operation, viz.,  
" the registration of deaths; and all the requisite  
" powers for stamping out the disease in the newly  
" infected locality could at once be set in full operation.  
" All our Sanitary Acts provide for any instances of this  
" or other infectious disease when introduced into our  
" seaports by ships, ordering the removal of the sick to  
" an hospital or other place for their reception; but in  
" this (as in the case of our own poor in these same  
" hospitals and places), totally forgetting to regulate  
" their due isolation, so that they may not heedlessly  
" sow and scatter round them the seeds of disease and  
" death.

" Measures of quarantine and isolation, similar to  
" those I have suggested in the present paper, have  
" been tried elsewhere in the British dominions, and  
" found to answer. At the various ports of South  
" Australia, all entrance to those affected and capable  
" of spreading small-pox has been so well guarded  
" against, that in only one instance, as mentioned to  
" me by Dr. Grainger Stewart, has the disease spread  
" landward into the city of Melbourne, in conse-  
" quence of an affected individual getting into the  
" town through the misrepresentation of the captain  
" and surgeon of the ship in which he arrived. He  
" inflicted the disease upon nearly 20 of the residents.  
" The authorities then interfered, placed all the affected  
" in an inland quarantine station, and the disease spread  
" no further. Thus the malady was at once stamped  
" out.

" My observations in the present communication refer  
" especially to the stamping out of small-pox, for I  
" believe it is the malady whose extirpation could thus  
" most easily be effected. But the same principles  
" apply, and will, I believe, be applied betimes to  
" these other analogous diseases when the science of  
" public health is more advanced, for the study of it  
" is yet in its infancy. Scarletina and measles will  
" become greatly reduced, if not extirpated, by an  
" observance of similar rules."

My Lord, I am anxious to direct the special attention  
of the Commission to Sir James Simpson's proposal  
for stamping out small-pox.

10,985. (*Chairman.*) There is one point suggested by  
a passage which you have read. Why should the pole-  
axe be resorted to in the case of cattle if it were not  
difficult to secure the desired result by isolation alone?  
—It is resorted to in dealing with cattle plague, and  
the reason is this, that isolation without slaughter  
would be a useless expenditure of money because the  
animal is almost certain to die of the cattle plague.

10,986. But they do not only kill the animals that  
have the cattle plague, do they? I thought they killed  
the animals that were in contact with the disease.  
Did not that indicate rather the view that even in the  
case of animals where it would be much more easy, I  
suppose, than in the case of mankind, it was difficult to  
secure the necessary isolation so long as the animals  
were alive?—Supposing a case of cattle plague occurred  
amongst some very valuable pedigree cattle, you would  
slaughter the cases in which it happened, and you would  
watch the rest strictly, and if the symptoms ap-  
peared you would slaughter those in which they  
appeared.



10,987. (*Dr. Bristowe.*) Are you sure they do not slaughter all?—I forget whether they did in 1877.

10,988. (*Sir William Savory.*) But those that were not slaughtered would be carefully isolated; that is the essential part of the system?—Yes.

10,989. Not only those who had the disease actually, but those who had been exposed to it?—Yes.

10,990. (*Chairman.*) But isolation coupled with or not coupled with a system of destruction would be a comparatively easier thing in the case of animals than in the case of men, would it not? For example, you could keep any other animals from going into a field or building where those animals had been, you cannot do the same sort of thing with man?—Not quite so easily, but still there are difficulties in the way of dealing with the cattle, because when you have drawn your cordon you have to prevent any attendants or people who may have come from other cases of cattle plague from introducing it again. I should think the difficulty in the two cases was about equal. Of course, the isolation of

a whole herd could be done more easily because the human individuals in contact do not contract the disease.

10,991. Would you advocate the isolation of all cases of contagious disease in human beings?—I recommend isolation, but I wish to insist upon this, that I think small-pox ought not to be placed under the same legislation or in the same category as measles, scarlet-fever, or whooping-cough. I think that small-pox lends itself to legislation much more easily than measles, for instance. I should like to see special legislation in the case of small-pox, but that again is one of the questions I am anxious to deal with later on. My purpose to-day has been to deal with the evidence of Sir James Simpson upon the stamping out system.

10,992. (*Professor Michael Foster.*) Have you read any evidence of the isolation system being applied to horses in this country?—Only in regard to glanders, where the recognition that the disease of glanders was a disease communicable from one animal to another has led to it being almost stamped out; in the army at all events.

*Prof. E. M. Crookshank, M.B.*

23 July 1890.

Adjourned till Wednesday next at 1 o'clock.

## Forty-fifth Day.

Wednesday, 30th July 1890.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Mr. CHARLES BRADLAUGH, M.P.  
Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
Professor MICHAEL FOSTER.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary.*

Professor EDGAR MARCH CROOKSHANK, M.B., further examined.

10,993. (*Chairman.*) You wish to make some corrections of or additions to certain answers that you gave on the last occasion; the first of those I believe is the answer to Question 10,892?—Yes, there are certain additions I wish to make. I wish to say, in answer to a question asked by Sir James Paget with reference to the plague, that it would be of interest if I put in certain chapters, entitled "Of the methods to be taken against the plague" from the work of Dr. Mead, and was showing the origin of the isolation system. I think it would be of interest and of value to the Commission.

10,994. Will you just state whose work it is and what chapter it is?—I desire to put in the Dedication to the work of Dr. Richard Mead, entitled "A Discourse 'on the Plague' and Chapters I. and II. namely: (I.) "Of the Methods to be taken against the Plague," and (II.) "Of Stopping the Progress of the Plague if it should enter our Country."

10,995. At what date was that published?—My edition is 1765, but the proposal was first made in 1720.

10,996. Will you hand it in?—Certainly. (*The paper was handed in. See Appendix I., page 400.*)

10,997. (*Sir James Paget.*) Were any of the methods suggested by Mead adopted?—Yes.

10,998. Where?—There were regulations instituted for quarantine and so forth.

10,999. In London?—Yes.

11,000. (*Chairman.*) Then you wish to make some addition to your answer to Question 10,917?—Yes: I should like to call the attention of the Commission amplifying a statement which I read from Dr. Black's work entitled, "London, Ancient and Modern," written by Dr. Vivian Poore: there are one or two extracts I should like to read with reference to the

health of Old London, contrasting it with London of the present day.

11,001. When was the work written?—In 1889.

11,002. What generally is the effect of this?—It is a discussion upon the causes of the high mortality in Old London, with a description of the sanitary condition of Old London.

11,003. That is a very recent work; is there any authority given for those statements, or are they merely his speculations?—The authorities are given.

11,004. Then whatever authority he has for his statement we shall find referred to in the book?—Yes; these are the passages: "That mediæval London was very unhealthy there is no question, but whether it was more or less unhealthy than other cities of the time is doubtful. It would be difficult, however, to conceive a worse state of public health than that prevalent in Old London."

"What were the chief ordinary diseases of London?"

"This question may be answered by reference to the 'Bills of Mortality' . . . ."

"What were the causes of the high mortality in Old London?"

"The situation was not healthy because of the marshy surroundings of the city. Ague and dysentery were always present, and were terribly fatal. Not only was the ground around the city marshy, but it was probably filthy as well. The old town ditch was used as a receptacle for all kinds of filth, and the cleansing of it was a great work, which was only occasionally undertaken. When Moorfields was drained, and the other marshy districts improved, one great cause of sickness disappeared."

"The city itself was certainly as foul as could be. The streets were unpaved or paved only with rough

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"cobble stones. There were no side walks. The houses projected over the roadway, and were unprovided with rain-water gutters, and during a shower the rain fell from the roofs into the middle of the street. These streets were filthy from constant contributions of slops and ordure from animals and human beings. There were no underground drains, and the soil of the town was soaked with the filth of centuries. This sodden condition of the soil must have affected the wells to a greater or less extent.

"The streets were filthy without, the houses were filthy within. The rooms of the poor were more like pig-styes than human habitations, unventilated, and strewn with rushes, which were seldom changed; and the wretched inhabitants closely packed in these miserable hovels, must have become very prone to suffer from infection of all kinds . . . . .

"A most important factor in the causation of disease was the moral condition of the population, which was very low, and marked by superstition, ignorance, and brutality. An age when even the better classes crowded into Smithfield to see some poor wretch burnt; when the most brutal punishments were inflicted for comparatively slight offences; when kings beheaded their subjects and even their wives, almost as a matter of course; when the ghastly heads of executed persons stared from the city gates; when religious-minded puritans could do nothing with a misguided king but behead him, and when restored 'monarchy' exhumed the dead bodies of political offenders in order that it might wreak an unmeaning vengeance on a corpse; and when even ladies in good positions in society flocked to see these sickening exhibitions, was not an age in which the nobler feelings of Christianity were easily evoked; and without these feelings, measures for securing public health, which cannot be fostered except in connection with public decency, found no place among the ideas of governors or governed . . . . .

"Another cause of the high death-rate was superstition, which regarded disease as a 'visitation' which had to be borne without question or inquiry.

"With such an attitude towards epidemics, which by some were regarded as due to an unfortunate conjunction of certain planets, it is not to be wondered at that the epidemics were mismanaged; and it is certainly difficult to imagine any measure better calculated to cause the spread of the plague than that of forbidding those affected to leave their houses, and compelling them to stay indoors and infect the rest of the household. The most efficient of all measures which we nowadays adopt for preserving the public health is that of the instant separation of the sick from among the healthy. A plan which had been adopted in old time in the case of 'leprosy,' and which we re-introduced in the last century, when the first small-pox hospital was built.

"Another great cause of the high mortality was the ignorance of the physicians, who were almost as superstitious as the populace, and who were entirely without any exact or correct knowledge of their art, which they practised almost entirely by the light of the old Greek, Roman, and Arabian writers.

"To recapitulate, the causes of the high death-rate were probably the following :

- "1. The prevalence of ague from the abundant marshes.
- "2. The dirt of the city and the houses, and the probable infection of wells from a soil sodden with putrefactive matter.
- "3. The ill-nourished, drunken, and scorbutic condition of the people; and
- "4. Their condition of superstition and brutality, which made any rules for public health impossible.
- "5. The neglect to separate the infected from the healthy.
- "6. The ignorance of the doctors . . . . .

"There can be no doubt that down to the commencement of the present century London was a veritable fever bed, the causes of death being largely malarial fever, spotted or typhus fever, plague, small-pox, measles, scarlet fever, and whooping-cough, the two latter being comparatively recent introductions . . . .

"Although we have to make many allowances, and take many things into consideration before we can estimate the true value of the London death-rate, it is, of course, undeniable that an enormous improvement in the health of the city has taken place since the beginning of the present century. To what is this due?

"The chief cause is the increase of knowledge as to the modes in which diseases are spread. Our knowledge of the mode in which small-pox, scarlet fever, cholera, and typhoid are disseminated has led to the establishment of fever hospitals, and to the improvement of the water supply, and the inspection of dairies. It is not only that the knowledge of doctors has increased, but what is more important, this knowledge has spread to the public, and as 'self-preservation is the first law of nature,' the public has assisted in protecting itself."

11,005. (*Dr. Bristowe.*) That is a popular work, is it not?—They were addresses given at the Parke's Museum and Sanitary Institute.

11,006. (*Chairman.*) You desire, I believe, to give some further answer to Question 10,946?—I should like to read an extract from Haygarth's work upon the "Prevention of Infectious Fevers" written in the year 1801; it proves that Haygarth did consider that isolation without inoculation was worth keeping up, which answers the question put by your Lordship; because, of course, in typhus fever there was no preventive inoculation attempted. This is his scheme with the results in the case of infectious fevers, principally typhus.

11,007. The result of experiences where, at Chester?—At Chester and Manchester.

11,008. Is what you have an extract or a copy?—It is a copy.

11,009. Will you read it?—This is a letter to Dr. Waterhouse, Cambridge, New England: "Bath, January 25th, 1799. Four years ago I sent you some observations of mine on the best method of performing quarantine for the Plague, printed with the posthumous works of the late Mr. Howard, and a letter containing enquiries to illustrate the nature of the contagion which has spread the fatal pestilence through Philadelphia and some other cities. You are intimately acquainted with the mode of preventing the small-pox proposed in my 'Inquiry, Sketch and Correspondence.' No subsequent fact has occurred or been communicated to me which can in the slightest degree invalidate the principles attempted to be established in those publications. In like manner I have discovered that mankind may be preserved from the contagion which produces the typhus fever with still greater ease and certainty. I find 1st. That this poison infects 22 out of 23 persons exposed to it for nights and days in a close dirty small room. 2nd. That in a clean airy and spacious chamber few or none are infected. These facts prove incontrovertibly to what a narrow sphere the typhus contagion is limited. And 3rd. That the poison remains generally from 10 days to six weeks or longer, from the time of exposure till the commencement of the fever, in a latent state. Upon these principles I proposed to receive all the poor citizens of Chester ill of infectious fevers into separate wards of the infirmary. The proposal was approved, and has been executed for 15 years. During this period the 'Rules of Prevention,' which you will find in Howard on Lazarettos, page 208, have effectually answered their intention, so that not a single patient in other parts of the house was ever suspected to be infected by the fever. A fatal and infectious fever had long prevailed at Manchester and its neighbourhood. In 1796 the Chester plan of taking poor people ill of infectious fevers out of their own houses and receiving them into separate wards adjoining to the infirmary was adopted. The success of this measure has been most wonderful; the number of fever patients in a certain district of the town, for two years and eight months which preceded this establishment, was 1,256, something more than the average of 400 a year. The fever in the same district from July 1796 (a period commencing two months after the establishment of the House of Recovery) to July 1797 (being 12 months), were only 26; of these in the last four months (from March to July 1797) there was only one fever patient. In the year 1796 there was a decrease of near 400 in the Bills of Mortality at Manchester, comparing the two years which preceded and succeeded this institution. The charge of the overseers for coffins was diminished nearly one third in the latter period. I cannot entertain a single doubt that exactly the same measures would speedily and effectually exterminate the pestilence which has so dreadfully afflicted America, as far as I may trust, to the analogy of the variolous and typhous contagions."



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11,010. The next point you wish to refer to is your answer to Question 10,949, is it not?—Yes. This is a point I should like to see corrected; there seems to have been a misunderstanding between your Lordship and myself as to the particular letter that was referred to. If you will turn to Question 10,945 your Lordship will see that Professor Foster said: “Haygarth himself was of opinion that vaccination instead of replacing his system might appropriately have been made a part of it.” Professor Foster had quoted a letter to that effect; and at Question 10,948, in answer to Sir William Savory, I said: “I think the last reference is the letter that Professor Foster quoted”; that is to say, Haygarth’s letter with reference to vaccination; and your Lordship said: “No, that was published in 1792.” It is quite evident that your Lordship is referring to one letter and I am referring to another; it could not have been published in 1792, because the date of Jenner’s inquiry is 1798.

11,011. (*Chairman.*) I think I must have been referring to the letter written in 1792, which is mentioned in Question 10,941, because, as far as I know, that statement about vaccination was not made in a letter, was it?—Yes; it was in a letter.

(*Professor Michael Foster.*) In a letter from Haygarth to Cappel, in the year 1800.

11,012. (*Chairman.*) That, no doubt, was the cause of the confusion; the only letter mentioned is a letter written in 1792?—So that my statement was quite accurate; the letter I was referring to was the letter written in 1800 which Professor Foster quoted.

11,013. You wish also to say something with reference to your answer to Question 10,925?—I there suggested, purely from memory, that the difficulty in carrying out the Chester system was possibly a question of subscriptions, and I should like just to point out that my statement was not erroneous upon that point. There were two things which interfered with the success of the system; they are referred to on pages 194 and 195 in Haygarth’s book: in speaking of difficulties while discussing the success of his plan, he says, “The chief occasion of this misfortune has been a want of early information after a family became infectious, so that, in many instances, the inspectors had not received intelligence of the distemper till two or three weeks after it had appeared in a family, and not till it was quite over in many other families; in the former case, much mischief was done before the Rules of Prevention were delivered to them, and in the latter case they received no rules at all. This want of early intelligence, we are clearly convinced, has, in great measure, been occasioned, by not giving the reward of information, so punctually and so promptly as ought to have been done, and by its not being generally known that such reward might be obtained. Both these errors, the Committee have taken measures to correct, and in a manner that they trust will be effectual.” Then on page 204 of the same book it appears that the system of giving rewards to those who were inoculated was abolished. That was the system which was abolished; but the system of giving rewards for notification went on; and Haygarth says, “For this humane and beneficent purpose, we are sorry to observe that our fund is likely to become deficient, and are, therefore, under the necessity of again soliciting the charitable aid of our fellow citizens and other well-wishers to Chester.”

11,014. Does it appear how that was responded to?—It does not say how it was responded to except that on page 208 there is a little account given, “Receipts, 1799; Disbursements for four years, 1701.” That is at the conclusion of the book, and that is the fact I had in my mind when I said that possibly funds had something to do with it.

11,015. The next point is that you wish to make an addition to your answer to Question 10,957?—There is another statement that I should like to put in before that, if I may, showing the effect upon the profession generally of this new doctrine of isolation. I have written it out from the “Medical and Chirurgical Review” of 1796, page 146. This is the editor’s criticism of a work published in Germany, and, of course, as it was published in the “Medical and Chirurgical Review,” it naturally drew the attention of the profession in England to the subject: “An essay on the Duty of Man to separate persons infected with the Small-pox from those in Health, hereby to effect the

“Extirpation of that Disease equally from the Towns and Countries of Europe,” by B. L. Faust, Leipzig. . . . Thus it is proved that the small-pox is not a necessary or unavoidable evil of mankind; it can be annihilated, and ought to be; it is a sacred duty to deliver from its ravages the present and future generations, and we commit a heinous crime in not using the means in our power to put an end to so dreadful an evil. The question is by what means can this be effected? The whole mystery is explained in a single maxim. The first person ill in a place is the only source from which all the rest, perhaps hundreds and thousands, become affected; let him be put immediately into a situation where he cannot injure by contact, those who have not had the disorder. It is the duty of the individual and of the community; it is a duty owed to society and to the human race. We observe this duty when a maniac becomes dangerous to society, and shall we omit it here where the danger is infinitely greater, and perhaps causes the deaths of thousands? And in the former, the separation lasts for years, and perhaps during life, whilst in the latter it is only necessary for a fortnight or three weeks; for the infectious period lasts only from the time of eruption to the complete falling off of the pustules. The principal means which M. Faust, therefore, points out for the execution of this great plan, are: 1. That people of all conditions should first be instructed by sensible writings that the small-pox is not necessary nor unavoidable, that its existence depends on our will, and that it is our duty to annihilate it. 2. A description of the disease with good ideas thereof, should be circulated in all villages, in order that it may be immediately recognised. 3. Near each great town a moderately large house should be erected for the small-pox, and an inspector appointed. 4. All the inhabitants of towns and villages should contribute to its support. 5. As soon as any person is attacked with the disease he should be immediately removed to a house of this description. . . . If these rules are duly followed, continues M. Faust, it may with certainty be depended on, that in five or six years the small-pox will no longer be found to exist in the civilized part of Europe just as the plague itself is extirpated.”

Then more directly in answer to Question 10,957, I want to point out that although Haygarth’s system as a system of rewards and so on was dropped, still this great principle of dealing with infectious diseases was being carried out; I mean to say the great principle which was advocated by Haygarth of the early separation of those infected with small-pox; this is a passage from Dimsdale, and the date of the book is 1781. It gives a very good idea of the extent to which both in the country, and in the towns this great principle was being carried out. Dimsdale says at page 150: “If this disease” [small-pox] “was the off-spring of a particular epidemical air alone, it certainly could not be restrained by any care or precautionary methods: but that the reverse is the case will appear to everyone who attends to the following remarks. In the most considerable towns in England the inhabitants, having experienced great injury to their trade, and the loss of many lives by this disease becoming universal, have, at a public expense, provided a house (and in some places more than one) which is called the pest house, situated at a convenient distance from the town and alone, to which all the poor who fall ill are removed as soon as it is discovered that they have the small-pox; such houses are provided near most of the considerable towns in my neighbourhood in the country; medical assistance and nurses are afforded; due care is taken to bury the dead privately, and to give such patients as recover proper airings until they may be in a state to return home without danger of infecting others: this method when duly complied with has stopped the spreading of the disease, and prevented the contagion from becoming general, and the great benefit derived from it is so apparent, that even parochial parsimony approves and allows the expense.”

11,016. (*Chairman.*) Does he indicate at all how long that had been going on?—No; there is no reference to that, but this book was published in 1781.

11,017. (*Sir James Paget.*) Does he say where the disease occurred?—He does not say that, but he says the system was at that date carried out in most of the considerable towns in England.

11,018. (*Chairman.*) Is that a new work or is it a later edition of an earlier work?—This appears in



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Dimsdale's work entitled "Tracts on Inoculation, "Written and Published at St. Petersburg in the year 1768; with Additional Observations: 1781."

11,019. Have you observed whether that statement you have just read appears for the first time in the edition of 1781, or whether it appears in the earlier editions also?—I do not think it appears in the earlier editions because it is in the chapter "Additional Observations" so I think 1781 would be the date when it was first published.

11,020. (Mr. Meadows White.) What is the date of Haygarth's papers?—His first paper was published in Chester about the year 1776 and the last in 1801.

11,021. (Professor Michael Foster.) But the "Short Sketch" was published in 1783 was it not?—In 1784.

11,022. Subsequently to the publication of Dimsdale's book?—Yes, but Haygarth advocated isolation before that, I think in a paper in the "Philosophical Transactions."

11,023. What paper do you refer to?—I cannot give you the title.

11,024. The only paper I know of Haygarth's in the "Philosophical Transactions" is a paper on the statistics of Chester?—He refers to the paper I mean, in his book on infectious fevers; that is the first time he published anything upon the isolation system.

11,025. (Sir James Paget.) Does either Haygarth or Dimsdale imply that that system had been or would be successful without inoculation?—Yes; Haygarth does, but Dimsdale is not discussing Haygarth's system at all, he only makes this statement with reference to pest-houses in discussing the etiology of small-pox.

11,026. (Chairman.) Are the persons to whom he refers persons who took the disease naturally or inoculated persons?—He is discussing natural small-pox; he is arguing against the idea that it was derived from epidemical air.

11,027. The next point to which you wish to refer is Question 10,958?—The statement was made by Sir William Savory that "People have always been afraid of the disease and kept out of the way of it as much as possible." Then in answering Question 10,965, I promised Mr. Meadows White to give the reference which disproved that statement. I could not from memory give the reference; the references with regard to the action and the carelessness of the poor in this matter are these; we may first of all take the period before inoculation. Adams, in his "Morbid Poisons," says, "In the small-pox (the most formidable of all), the seasons so strikingly pointed out a favourable or unfavourable sort, that it is not to be wondered if children were voluntarily exposed to that contagion when it appeared in its mildest form. This was in some degree the custom in our memory before inoculation had acquired the reputation, which it retained till the discovery of vaccination . . . . Before the introduction of inoculation, it was submitted to as a necessary evil attendant on the metropolis." And then in a footnote on page 398 he again refers to the matter; he says, "I cannot now tell in what Journal or Transactions I have read an account of a small-pox so generally mild, that after a time no one took the trouble to inoculate, but exposed themselves without fear." Then we come to the inoculation period when Dimsdale (Edition 1776, page 41) says, "The inoculated may be divided into two classes. One in whom the distemper is so mild as to admit the parties to go abroad; the other, where the number of pustules is so considerable as to confine the patients at home; by far the greater number will be of the first sort, and whatever orders may be given to the contrary, it will be impossible to restrain them from taking undue liberties; the children who are of an age for it will be found in the streets with their former play-fellows, and the men and women who are able, will be endeavouring to get into their former employments to earn a little money, without regarding the injury they may occasion to others." Then there are two or three references to Haygarth; the carelessness of the poor was one of the difficulties he had to deal with in carrying out his scheme without compulsion. He says at page 198, "We will next state the difficulty and the success of our endeavours to prevent the progress of the natural small-pox. The same people who refused inoculation, and they are a large proportion of the inhabitants, are fearless or rather desirous that their children should be infected

"with the natural small-pox. It is with concern, we remark, that in one part of the town (Cross Gun Entry, Forest Street) the inhabitants, disregarding the inspector's exhortations, have purposely propagated the distemper, carrying the poison, and even the patients from one house to another, without reserve. In consequence of this conduct, it spread through 15 families, infecting all in this entry liable to it, and proved fatal to several. In another quarter, the poor people allowed their children to have an unreserved intercourse with the infectious." Again he says: "However wonderful it may seem, we believe, in several other cases that the parents who rejected the proposal of inoculating their children, purposely exposed them to catch the natural infection. Though some of our fellow citizens are so careless in dispersing the deadly poison of the small-pox, yet they would regard with horror any person who should purposely administer arsenic or any other deadly poison to innocent infants." Then there is another quotation from Haygarth's work in 1793 which I have already put in evidence; he is referring to the deaths at Chester before he introduced his system, and he says, "The populace very generally, regarding the distemper as inevitable, neither fear nor shun it; but much more frequently by voluntary and intentional intercourse endeavour to catch the casual infection" (page 491.) Those were the references I had in my mind.

11,028. (Sir William Savory.) I think you might quote a great many more to that effect, but it does not touch the point. Certain people are careless of or indifferent to the infection, but that does not apply to the great bulk of the population; just as in the case of measles which you quoted more recently, many think that it is necessary to have it, but still a great many more people dread it and desire to avoid it; that statement of yours is quite compatible with the fact that small-pox has always been dreaded, and that the great mass of the population endeavour to escape it?—Then a little lower down on the same page, after Question 10,964a, Professor Foster volunteered the statement that "owing to inoculation small-pox had become so mild that people did not take the same steps to avoid it as they did before." I do not agree that it was "owing to inoculation" for the poor people refused inoculation. Then Mr. Meadows White suggested a passage from Dimsdale, and I said I would give the quotations if I might be allowed to do so at the next meeting. I was anxious to make my position clear. I had in my mind these statements of Haygarth, Adams, and Dimsdale with reference to the poor. Then Professor Foster gave a quotation, but this referred (Question 10,967) to a gentleman's family, and I think we must make a distinction between a gentleman's family and a poor man's family in respect to the possibilities of infection with small-pox.

11,029. But my question was put with another purpose, and you will observe the force of the quotation you have just read, that inasmuch as small-pox was milder people did not take the same care to avoid it as they did before?—That was one of the quotations; but I have also given a quotation from Adams to show that before inoculation the poor were careless.

11,030. But I think you have not shown that the people accepted small-pox as an inevitable thing and that no one took any care about escaping it?—Adams' statement bears me out distinctly; he says that "before the introduction of inoculation, it was submitted to as a necessary evil."

11,031. Just as the measles is submitted to now as a necessary evil; but we know that most families try to escape it?—They used so to regard measles, but I would not say that they do so now. The point I think of the whole matter is this: when you said "people have always been afraid of the disease and kept out of the way of it as much as possible," I was thinking of the poor and of these abstracts, which show, according to Haygarth, that people were not always afraid of it and they did not keep out of the way of it as much as was possible.

11,032. (Professor Michael Foster.) Can you point to any infectious disease among cattle for which a method of protective inoculation has been proposed and which has been claimed by its supporters to be as effective and as lasting and as attended with so few bad consequences as the advocates of vaccination claim for their method with reference to small-pox, and where such a method has been rejected in favour of isolation without slaughter?—That is rather a compound question and I will answer



it by instalments. First of all with reference to a parallel case of protective inoculation I think you have it in sheep small-pox.

11,033. What is the method of inoculation for sheep small-pox?—Inoculating with the lymph.

11,034. Giving them the same disease?—Yes.

11,035. A contagious disease?—Yes.

11,036. That is quite different from vaccination, is it not?—It is in that respect. I am not aware of any instance in which an infectious disease has been communicated in a non-infectious form in the case of diseases in animals.

11,037. (*Dr. Collins.*) Do you happen to know the experience respecting anthrax protective inoculation in Austria-Hungary?—No, but there is the experience in Germany; I am not quite sure whether it is the same.

11,038. (*Professor Michael Foster.*) There is experience also of anthrax in the Pampas?—Yes; in answer to your question one might give the instance of anthrax; only the anthrax vaccine may produce virulent anthrax instead of giving immunity against anthrax; so that it is not on the same footing.

11,039. Even in spite of that it has been in certain quarters, has it not, largely used in preference to isolation without slaughter?—Only in France, I think.

11,040. And in South America?—I think not. I do not know what the anthrax is in South America, whether it is true anthrax or charbon symptomatique, whether they do or do not inoculate; but in Germany the practice has been condemned, and in this country too.

11,041. Was not it the fact that Professor Roy went out to South America to inoculate the cattle of the Pampas by a so-called vaccine for anthrax, and was successful?—I have not read Professor Roy's paper only a summary of it, so I am afraid I could not answer that question, but the subject was investigated in Germany, and the results have been summed up by Flügge, who is a great authority upon this subject. He says (*Flügge, Micro-organisms, pages 757-8*) "In judging of the results obtained we must, in the first place, note that the effect of the protective inoculation differs in different species of animals, for example, guinea-pigs and rabbits cannot be made immune by the attenuated anthrax bacilli; rats often resist inoculation with the virulent material, but do not thereby acquire immunity. In like manner the effect is different in sheep and cattle, the two species of animals chiefly inoculated in practice. In the case of sheep the protective inoculation appears to be particularly uncertain in its results; too weak vaccines do not give the necessary guarantee for immunity; too strong materials, on the other hand, readily cause the death of the animal; further, the duration of the protection is very short, probably not lasting more than a year, and it has also been shown by Koch that sheep inoculated with strong vaccines are not able to resist natural infection produced by feeding them with anthrax spores."

11,042. All that goes to shows that there is no system of protective inoculation at all comparable to what is claimed for vaccination?—I should not say "at all comparable," but not exactly upon the same footing.

11,043. (*Sir James Paget.*) Is there any case in which the inoculated disease does not remain contagious?—I think not; I should require to have notice of such a question as that. I have my mind on another part of the subject altogether, and it is rather difficult to suddenly turn one's mind in another direction entirely.

11,044. The contrast between small-pox inoculation and vaccination is that even if they produce diseases of equally slight severity the one is and the other is not contagious. Is there any corresponding fact to that in any of the diseases inoculated in animals?—I question whether it is a fact, but I think they claim in France in charbon symptomatique, that the inoculated animals do not convey the disease. (*To the Chairman.*) I would suggest to your Lordship that in reference to the superiority of the stamping out system over protective inoculation, I am quite sure the authorities of the Board of Agriculture, if they were asked, would give evidence upon the subject.

11,045. As far as I know, no one has studied the subject in England more than yourself, so that we should be very glad to have your judgment upon it?—I should be glad to think your question over, but I am not prepared to answer it without notice.

11,046. (*Dr. Collins.*) Am I right in saying that prior to the experience which you have just stated to the Commission of the results in Germany by Flügge, a pretty strong claim had been set forth on behalf of protection by inoculation with anthrax?—Yes, that is so; and Flügge's summing up with reference to inoculation for chicken cholera is equally in opposition to the value that has been claimed for it by others.

11,047. (*Chairman.*) You have some paper to hand in with reference to the stamping-out system in New South Wales and in Tasmania?—I propose to hand this paper in if you think it would be of interest; it is simply from the point of view of legislation. It is an abstract of the various Acts by which what might be called a stamping-out system in small-pox has been carried out in Australia from as far back as 1832.

11,048. But we had the President of the Board of Health in New South Wales examined, and he told us all there was to tell us about isolation in New South Wales?—I was reading his evidence in the train this morning, but I do not think he gave you the Acts, or I should have kept this back. I had copied out the Infectious Diseases Supervision Act.

11,049. We have not had Tasmania referred to at all, what have you to say about that?—With reference to Tasmania, the Agent-General for Tasmania kindly assisted me in the matter, and I found that they have adopted the New South Wales regulations, and that since this year vaccination is no longer compulsory. Then here is a report which I do not put in as evidence but another matter has brought me into contact with the Agent-General, and if it is of any interest I should be glad to give the Commission the benefit of it; it gives the returns for vaccination in Tasmania, and that gives us one reason, probably, why they have now withdrawn the compulsion.

11,050. What is that; is that the Government return?—This is the Government return of the number vaccinated.

11,051. I think we had better have that officially from the Agent-General; what is the name of the paper?—This document is the Central Board of Health Report for 1888, and the particulars to which I refer are to be found on pages 14 and 15.

11,052. (*Mr. Meadows White.*) What is the date of the Act which made vaccination cease to be compulsory?—I see that in this document there is a reference to the Vaccination Act of 1882, and I suppose that is the Act which has been withdrawn recently.

11,053. Could you give the citation from the Act or the authority, whatever it is, which has made compulsory vaccination cease?—No, I was only informed of it in the Agent-General's office.

11,054. (*Chairman.*) You next desire, I believe, to hand in some papers with reference to isolation on board ship?—These are statements I should like to pass over rather rapidly. In the course of my general reading I have come across instances of small-pox breaking out on board ship, for instance, the case which is given in Dr. Burnett's report to the Admiralty Board in 1825. The small-pox broke out first of all in a seaman, and this disease was communicated to 17 persons on board. "Of these 10 appeared to have been properly vaccinated, seven of whom were midshipmen from 16 to 23 years of age, who had had the cow-pox when children; two were boys who had undergone vaccination on board but a few weeks before, and in one the time when vaccinated is not stated. In three of this number the disease assumed a severe form. Besides these 10 persons, two who were undergoing the process of vaccination on board were attacked with variola, one on the 6th and the other on the 14th day after being vaccinated, the former of whom died, and the latter recovered with difficulty." The next reference is to small-pox occurring on a flag-ship on the coast of China in the hot season of 1869, and it is stated that isolation was impracticable, though no reasons were given why it was so. There were 44 cases of small-pox on board. I am only putting this in, I must confess, as an inference. It seems to me that had the first case which occurred been promptly isolated, the other cases would not have occurred. Then the account which the Agent-General of New South Wales has kindly given me is with reference to the steamship "Preussen," this is comparatively recently, and I find in glancing at the Report just issued, that that has been already before the Commission. I was struck with the statement in this Report: "Had the authorities at Albany, immediately on

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"the ship's arrival, removed the small-pox patient to the shore, and suitably disinfected the ship, it is reasonable to conclude that the terrible amount of suffering and danger which has since ensued might have been almost, if not altogether, averted." The Agent-General sent me that copy and my attention was arrested by that statement.

11,055. Does that conclude what you have to say with reference to isolation on board ship?—Yes.

11,056. The next head you wish to bring before the Commission relates to the contagion of cow-pox?—The headings which now follow relate to the pathology of "vaccination," and I propose to put before the Commission very briefly a short account of my own researches during the past three years. I read a paper, December 1887, before the Pathological Society of London, of which one of the honourable Commissioners was President, in reference to an outbreak of cow-pox, and in that paper I made a preliminary statement to the effect that I was devoting myself to the nature of the contagion of this disease, and to the study of any other organisms which might be present in vaccine lymph. I studied the organisms which were present in that case.

11,057. Where was that outbreak?—That outbreak was in Wiltshire; I was also studying for some weeks at Lamb's Conduit Street, and there I had an opportunity, through the kindness of the director, of making cultivations from vaccine lymph from different calves at different stages of the eruption. I referred to the results in the Wiltshire outbreak in the Report of the Agricultural Department of the Privy Council on Eruptive diseases of the teats of cows, page 11. I cultivated a number of different organisms. In addition to that, being at that time under the impression, as I believe most medical men are now, that all lymph is derived from cow-pox, I obtained different stocks of vaccine lymph for cultivation experiments, feeling quite sure that if I could discover the contagion, I should be able to do so in this way. I obtained, I think, nearly all the current stocks in use, including those that can be purchased from Messrs. Warlomont, Faulkner, and Renner; and since this paper of 1887 I have spent a great deal of time in endeavouring to discover the contagion of cow-pox.

11,058. Do you mean in trying to discover the organisms which would cause the disease?—Yes, to try and discover an organism which would cause the disease. Perhaps your Lordship is aware that a prize of 1,000*l.* has been offered by the Grocers' Company for anyone who could discover a method of cultivating vaccine lymph; but that was not what led me to undertake this research. I was investigating the subject of cow-pox for the Board of Agriculture, and I was therefore extremely anxious to find out the nature of the contagion; my researches have continued during the past three years, but have been interrupted at intervals; they have had at times to give way to more important researches, and also were interrupted during the winter of this year, when I was away from England. This part of my research is now complete, although the results have been very disappointing, that is to say, I have not been able to find any bacterium, any microbe, which one would be led to suppose was the organism of cow-pox.

11,059. You mean any specific organism?—Any specific organism; and that has made me turn to the literature of the subject, which I will just briefly refer to. Cohn was the first to describe, in 1872, micrococci in chains or clusters which he observed in the lymph of vaccinal vesicles. Quist, in 1883, speaks of having cultivated vaccine, and Ferré, in 1883, of having discovered a microbe. Voigt, in 1885, succeeded in discovering in vaccine three kinds of micrococci, a diplococcus, a large coccus, and a third form. Bauer, in 1885, found, besides bacilli and other micro-organisms, spherococci, either singly or disposed in groups of two or four, or in the form of chains; the groups of four were found in fresh lymph, and the chains in less recent lymph. Marotta, in 1886, observed a tetra-coccus, which he regarded as the specific micro-organism. Tenhot, in 1887, investigated the subject by modern methods, and found a dozen micrococci, two bacilli, and two yeasts. Garre in the same year found a micrococcus which appeared to him to be specific, and he even thought that he could produce with this organism vesicles, but inoculated on a child it neither produced any effect nor any immunity. Guttman, in 1887, investigated vaccine lymph, and found three organisms which appeared to be rather more constantly present

than others. Then Pfeiffer has contributed a very valuable paper; he has cultivated vaccine lymph by the methods of Koch, and has found a great number of different micro-organisms, but not one of them specific; he names especially *sarcina lutea* and *aurantiaca*, and the *staphylococcus pyogenes aureus*, *cereus*, and *albus*. My researches, independently in this country, bear out precisely some of the experiments carried out upon the Continent; more especially Pfeiffer's.

11,060. But some of them thought they found specific organisms; do you think they are mistaken?—They are, from the fact that I have been unable to find any organism which is constantly present in cow-pox lymph.

11,061. Is there any specific organism known as the contagion of small-pox?—No; some have endeavoured to find it, but the only organisms which are found in the small-pox pustule are found in ordinary pus.

11,062. (*Professor Michael Foster.*) Pfeiffer's doctrine was that the actual virus got entangled with the bacteria?—Yes.

11,063. I think that Pfeiffer claimed that he found considerable differences between the so-called humanized lymph and calf lymph?—That is so.

11,064. The organisms were much more abundant in the calf lymph?—There were more bacilli in the calf lymph upon the whole.

11,065. (*Chairman.*) The general conclusion upon that point is that the contagium of cow-pox is as yet undiscovered?—The contagium of cow-pox is as yet undiscovered; but since I commenced this inquiry I have been arrested by my literary researches, and we must not conclude that all the stocks I have been investigating were necessarily cow-pox. When I started upon this inquiry I believed that all vaccine lymph was derived from cow-pox, and that, therefore, in examining different stocks of lymph, if I found one organism constantly present in them, it would probably be the contagium. But now I find that not all the current stocks are derived from cow-pox.

11,066. I am not quite sure that I see what that points to, because in the case of small-pox, I suppose there is admittedly a single source of contagion which is as yet undiscovered?—Yes; the point is this: that when I first started upon this investigation, not having found any one organism characteristic of all these lymphs, I concluded that I had not found the contagium; but if those lymphs were derived from different diseases there would be need for further investigation.

11,067. In the cases you would now put down to cow-pox was there any organism found common to them?—No; only the organisms found in lymph and pus in other diseases.

11,068. (*Dr. Collins.*) There are other acute diseases of man, are there not, besides small-pox in which no particular micro-organism has been found?—Yes; typhus, scarlet fever, and measles.

11,069. (*Chairman.*) Then the absence of any specific contagium proves nothing; it is not inconsistent with all those having been the same disease?—No.

11,070. (*Dr. Bristowe.*) No specific organism has been found in any of the exanthematous diseases?—That is so. There are those who believe that there is a specific bacillus of typhoid fever, but I am not myself satisfied with the evidence which has been brought forward. Another research which I propose, will be to test the pathogenic properties of some of these organisms in vaccine lymph; that will be a different matter. I should like to hand to you these drawings, which show the different organisms found in the different stocks of vaccine lymph, as that research is finished. I may say that that work represents some 2,000 cultivations, so that it is a work which has not only extended over three years, but is of a very extensive character.

11,071. (*Chairman.*) Those do not represent all that you found?—Yes, they represent all the organisms I found in the particular stocks of lymph enumerated in the drawings. I may say that if there is any member of the Commission who is interested in the subject I shall be very glad to show him all my microscopical preparations and cultivations. The tubes represent the cultivations of the bacteria in artificial media, and the drawings beneath represent the microscopical appearances.



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11,072. (*Sir William Savory.*) Shall you found any inferences upon these facts to assist the Commission in this inquiry?—There are several points which they will bear upon in the evidence. It is chiefly the pathology which I understand is of interest to the Commission. For instance, it is rather a striking and interesting fact that in a lymph which has the character, I believe, of producing local irritation, I found an organism which might, possibly, account for it, namely, the bacillus of blue pus. Then, again, it is also interesting to mention that the number of organisms, speaking generally (that is a point I shall have to follow up), increases with the evolution of the lymph. I have never succeeded yet in getting lymph without any, but at Lamb's Conduit Street, where I was able to take the lymph myself from vesicles as soon as ever they appeared, I found sometimes I had only two organisms present; and if I took lymph later on the number of organisms increased.

11,073. Is not that what you would expect, and what one finds in many other instances?—Yes, certainly.

11,074. (*Professor Michael Foster.*) Do you mean taking it at a later stage or keeping it longer in a different manner?—Taking it at a later stage.

11,075. (*Dr. Collins.*) Could you give the Commission the names of the different lymphs of which different cultivations have been made?—Yes, I could do so if it was of any interest, but I should have to refer to my notes. I have not distinguished them in that diagram by name; I have simply called them 1, 2, and 3.

11,076. (*Chairman.*) Does that conclude all you have to say with reference to the contagium of cow-pox?—Yes.

11,077. (*Professor Michael Foster.*) Did your results corroborate those of Pfeiffer?—Yes.

11,078. That the organisms in calf lymph were much more abundant than in humanized lymph; that the staphylococcus is much more common in calf lymph?—Bacilli are much more common in calf lymph, but there is great variety in different human lymphs and in different calf lymphs. In one stock of calf lymph that I used I only found three organisms.

11,079. I gathered from Pfeiffer's account that in vaccinating from calf lymph there is much greater risk in introducing, I do not say pathogenic organisms, but organisms, than was the case when using humanized lymph; did your experiments corroborate that or negate it?—If you take some of those lymphs they would support it, and if you take some of the others they would not support it; I should really have to refer for a moment to my drawings; on the whole I should say that these experiments supported Pfeiffer, that there were more organisms in calf lymph than in humanized lymph. At the same time in one sample of humanized lymph which I had there were nine different organisms. The number would depend very much upon the time at which it was taken.

11,080. (*Sir William Savory.*) When you speak of the comparison between calf lymph and humanized lymph, do you bear in mind the relative age of the lymph in each case?—That has to be borne in mind.

11,081. When you are speaking of this comparison and answering these questions, are you bearing in mind the age of the lymph in each case?—As far as one can get it, but one can only speak generally.

11,082. Do you take the calf lymph and the human lymph of the same age and the same date; do you consider the same number of days to be of equal effect in the maturation of calf lymph and of human lymph?—They formed a separate set of experiments with calf lymph at Lamb's Conduit Street, without comparison at all with humanized lymph, and that was the only time I collected the lymph myself.

11,083. I merely wanted to know what views you had with regard to the comparison between the two; when you speak of comparing calf lymph with human lymph, of course, you bear in mind the age of the lymph?—Yes.

11,084. I ask whether you consider the same time in number of days to represent the same thing, that is to say, three or four days, to be the same for calf lymph as for humanized lymph?—No, because we know there is a difference; and one would have to bear that in mind.

11,085. If you have not exact data on that point, the comparison of the two lymphs with reference to the organisms they contain would not be worth much,

would it?—Those cases in which there were a larger number of organisms are specially the cases in which the purveyors of the lymph are credited with taking it late.

11,086. (*Chairman.*) But what Sir William Savory puts to you is that "late" would not mean the same thing in each case; that the same number of days would not mean the same amount of lateness in calf lymph as in human lymph?—Of course not.

11,087. Therefore, in comparing the same number of organisms in calf lymph and in human lymph, have you satisfied yourself that you have paid proper regard to the lateness?—No comparison in that respect between human and calf lymph had suggested itself to me until Professor Foster suggested it. In my researches I concentrated my attention on the discovery of the contagium.

11,088. (*Sir William Savory.*) I take it that you are not able to give us any data with reference to the comparative rate of maturation of calf and human lymph?—Only from information received and observation at Lamb's Conduit Street.

11,089. You have no facts to go upon?—I have no evidence to give the Commission upon that point; I should think that Dr. Cory would give you evidence upon that point.

11,090. (*Chairman.*) I think you stated you had given the Commission all the evidence that you propose to give with reference to the contagium of cow-pox?—Yes, but in glancing through the Commission's Second Report my eye caught a statement of Dr. Cory's that some cases of calf lymph contained the bacillus subtilis, and that it might in some cases produce inflammation; I have cultivated the bacillus subtilis from calf lymph, and I should like to say that there is no foundation for that statement; it is what we call a simple saprophyte, and there is no evidence to show that it has any pathogenic properties whatever.

11,091. (*Dr. Collins.*) I think I must trouble you for the names of the different stocks of lymph of which you have given us the cultivations?—I can give it you generally, but to give it more particularly I should have to refer to my notes. There is the Lamb's Conduit Street lymph which I have already referred to; there are Warlomont's, Faulkner's, and Renner's lymphs, and the lymph which they use at Aldershot.

11,092. (*Professor Michael Foster.*) Those were all calf lymphs, were they?—No; for instance, Faulkner's human lymph and Faulkner's calf lymph; Warlomont's human lymph and Warlomont's calf lymph.

11,093. (*Dr. Collins.*) Is there, among your series, any human lymph in use for ordinary public vaccinations from Whitehall?—Yes, but I should have to refer to my drawings for the number, it is one of those lymphs.

11,094. Should I be right in assuming that all those lymphs were supplied to you in such a condition that they might be used for ordinary vaccination?—Yes, I purchased most of them in the ordinary way.

11,095. If any of them therefore have been taken too late, they have not been taken too late in the eyes of the purveyor or sender for the purpose of ordinary vaccination?—No.

11,096. (*Sir William Savory.*) What do you mean by "too late"?—At a late period of the vesicle, they were simply handed to me as ordinary vaccine lymph, for my experiments, to discover the contagium.

11,097. (*Chairman.*) I thought you said you took some at Lamb's Conduit Street?—That was a different series of experiments; they are not included in these sheets of illustrations.

11,098. (*Dr. Collins.*) None of those lymphs apparently were taken by yourself?—No.

11,099. (*Chairman.*) Do those include any calf lymph from Lamb's Conduit Street?—Yes; this one containing only four different bacteria.

11,100. Was that supplied to you as lymph for vaccination?—Yes.

11,101. (*Professor Michael Foster.*) Taken on the fifth day?—Yes, taken on the fifth day.

11,102. And Warlomont's taken on the eighth day?—Yes; and that is interesting because that specimen of lymph contained the bacillus pyocyaneus.

11,103. Have you any reason to suppose that any of the lymph you have examined was lymph derived from



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the so-called Badcock's source?—I do not think so; but it is only recently that the possibility of these stocks being derived from different diseases has occurred to me.

11,104. (*Dr. Collins.*) Would you kindly state, for my information, the names of the various micro-organisms you have discovered in the various lymphs so far as they agree with organisms which have previously been named?—I can go through the list of them; in No. 1 lymph, a torula, bacillus pyocyaneus, and bacillus subtilis. Then in the next lymph a bacterium which corresponds with one of the varieties of proteus described by Hauser; staphylococcus pyogenes aureus; and a yellow bacterium, a chromogenic bacterium. Then the Lamb's Conduit Street lymph contained a bacterium and a micrococcus, the yellow bacterium, and a torula. Then the Aldershot lymph contained a yellow micrococcus, white micrococcus and torula, and a yellow sarcina, a white diplococcus, staphylococcus cereus albus, and a mould fungus which I have not identified. Then there is the calf vaccine No. 3, which I remember because I have tried to look up the reference to it; it came from America, and it is reported to be from the "only spontaneous case of cow-pox in America;" it is reported in one of the Pennsylvania Board of Health reports, but I have not been able to get a copy of that document.

11,105. I suppose it would be derived from a cultivation, and not from an original case of spontaneous cow-pox?—I can give you the card which is sent out with it; that contained a yellow sarcina, staphylococcus pyogenes cereus, a yellow micrococcus, a white bacillus, staphylococcus pyogenes albus, a large white micrococcus, a yellow micrococcus, the yellow bacterium, and a white micrococcus. Then human vaccine No. 1 contained a white micrococcus, another variety of proteus, and staphylococcus pyogenes aureus. Then No. 2 contained micrococcus, a tetracoccus, a white liquefying micrococcus, and a yellow bacterium. The next one contained white micrococcus, a yellow micrococcus, staphylococcus cereus flavus, a bacterium, a white micrococcus, a bacillus somewhat resembling the bacillus subtilis in calf lymph (possibly identical, that would require further study), staphylococcus pyogenes cereus and a brown tetracoccus. Summing them up, some of them are simply harmless saprophytes, several are organisms which you occasionally find in pus.

11,106. Which of the organisms you have enumerated would you regard as being, or as usually held to be, pathogenic?—The whole question of the relation of micro-organisms to suppuration requires investigation. I am, in fact, studying that subject now for Sir Joseph Lister, and I would rather not express any opinion on it at present, because I want to face the next part of my inquiry with a perfectly open mind, but some of them, I may say, are regarded as pathogenic by Continental observers.

11,107. Is the staphylococcus pyogenes aureus regarded as pathogenic by eminent microscopists?—Yes it is. I think the best account of the action on animals is given in Flügge at pages 185, 186, and 187. I thought it quite possible I might be asked that question, so I prepared the reference, but I wish it to be understood that I do not give this as my opinion because I want to investigate the whole subject anew. I am not at all satisfied in every particular with reference to the views which are commonly held on the subject of pyogenic organisms; it is, in fact, a question which I have been investigating for some time for Sir Joseph Lister.

11,108. Could you give us that statement in Flügge?—It refers to inoculation experiments. He says at page 185: "The action of the staphylococcus on animals varies greatly according to the mode of application. Subcutaneous inoculation is without result in mice, guinea pigs, and rabbits; when inoculated on the cornea of rabbits a small greyish white infiltration occurs, accompanied by inflammation, which subsides on the fourth day. After subcutaneous injections the pyogenic properties of the fungus become evident. It is only in mice, and after the injection of relatively large quantities, that death occurs early; in guinea pigs and rabbits, on the other hand, an abscess forms in the first instance, and this can either heal and the animal recover, or a general infection may ultimately occur. Intraperitoneal and intravenous injections usually kill the animals after from two to nine days. On post-mortem examination the most characteristic

alterations are found in the kidneys, which present the appearance of a septic embolic nephritis; whitish yellow masses from the size of pin points up to that of peas are present, and at times large wedges which infiltrate the kidney like pyramids. Many capillaries are completely blocked with thrombi consisting of cocci, as are also the smaller arteries in the cortex, as well as a few straight tubules. Further, purulent metastases often occur in joints, in the muscles, and where fractures have been recently made, in the medulla of the injured bones; frequently, however, the latter situation escapes, although recent fractures are present. Small quantities of the fungus are at times without effect, even when injected into the veins, nevertheless, in these cases also, deposits appear to form in the kidneys, but remain limited and heal. The deposits in the kidneys do not arise as the result of the excretion of the staphylococcus by the kidneys, nor does the localisation occur here in connexion with any protective excretion; on the contrary, it has been demonstrated by the experiments of Wyssokowitsch that not a single coccus appears in the urine during the first six hours after the injection of large quantities of staphylococcus, and that when cocci can be cultivated from the urine, deposits are always demonstrable in the kidneys. The cocci introduced into the blood are deposited in various organs, especially in the spleen, in the medulla of bone, &c., and they either soon die or remain for a long time capable of development. Staphylococcus occurs very frequently in man; it is the most common pyogenic organism. The experiments of Rosenbach and Passet, repeated recently with great care, have shown that materials mechanically and chemically irritating (turpentine and mercury) can only excite suppuration in extremely exceptional cases, when micro-organisms are not present at the same time. In almost all the cases of suppuration which come under observation in practice bacteria are the causal agents, and some forms of suppuration are more especially caused by staphylococcus aureus. This organism causes rapid suppurative destruction of the tissue, and it excites suppurative phlegmons, which spread more in the tissue than in the lymphatic vessels; hence it is found more especially in acute abscesses, in empyema, and in boils; further, in acute osteomyelitis, although the above-mentioned experiments in animals have not demonstrated with absolute certainty the causal rôle of this fungus in that disease. Lastly, it occurs at times in some severe diseases, accompanied by metastases in pyæmia and in ulcerative endocarditis. According to the point of entrance of the fungus into the body, and according to the numbers which enter, affections of very different severity may follow. That in reality the staphylococcus cultivated from pus from osteomyelitis is also the exciting cause of furuncular inflammation has been proved recently by an experiment made by Garré on himself."

These are views which, I think, want further working out, but still that is the accepted statement at the present day. Dr. Joseph Payne has also summarised these results very well. He says, commencing on page 642: "There can be no doubt that this organism is a direct producer of suppuration, and is able alone to set up this process. For proof it is hardly necessary to go beyond the experiments which several pathologists have made upon themselves. Thus Garré inoculated a small quantity of staphylococcus cultivation into the root of the nail of one of his fingers, and produced a subcutaneous suppuration—in fact, onychia. From this he cultivated the staphylococcus aureus, and finding that small masses did not succeed, he rubbed a considerable mass of the third cultivation with some force into the skin of his arm. After four days a formidable carbuncle was produced, with some scattered boils, and it was not till after many weeks that the eruption was healed, leaving behind it seventeen scars. A pure cultivation of staphylococcus aureus was obtained from the pus. Bockhart applied small quantities of the cultivated organism in a sterilised solution of salt to the skin of his arm, which was in one part slightly scratched, and found small furuncles, but chiefly pustules of impetigo, develop even where the skin was quite intact. Examination of the skin showed that the cocci entered the ducts of the sebaceous and sweat glands and sheaths of hairs; and where the skin was broken invaded the malpighian layer of epidermis. The explanation of Garré's results was doubtless that the cocci were firmly pressed



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"into the glands. Bumm succeeded in producing typical acute abscesses in the subcutaneous tissue of himself and others by injecting with a syringe (under the skin) small quantities of the cultivated staphylococcus along with salt solution. The abscesses were in some cases as large as a fist, and contained the organism in abundance. Compared with the above results, those of experiments on animals are less important and also less uniform. Mere subcutaneous inoculation produces little effect, but more forcible injection produces suppuration in rabbits and guinea-pigs. The organism injected into the peritoneum produces fatal peritonitis; and introduced into the blood has caused suppurative attacks and inflammation of the kidneys. Endocarditis has resulted if the valves of the heart were injured at the same time. The coccus of osteomyelitis, which is doubtless identical, has produced, when injected into the blood, inflammation of bones, if the bones had been previously injured. These results are less constant than in the human experiments, and the reason evidently is that the staphylococcus has more affinity for the human tissues, being, so far as it is a parasite, a parasite of man.

"It may be asked if this organism is so frequently present on the surface of the body, why does it not oftener produce suppuration? The reasons seem to be, first, that some kind of wound or else considerable pressure is necessary to enable the cocci to penetrate the skin; secondly, that some skins—for instance, those of children—are more easily penetrated, and thus children are particularly liable to impetigo, and to 'fester' wounds; and thirdly, there must be conditions not clearly definable which make the tissues of some persons, and of the same person at different times, especially liable to the attacks of bacteria or deficient in power of resistance. The facts of contagious suppuration previously stated (page 470) are explicable as due to the action of this micrococcus, and hardly in any other way; and the same is true of a portion of the process of pyæmia (page 473); since we must suppose that this, like other parasites, will produce very different results when introduced in the blood or tissues than to those it produces in the skin or external parts.

"There can be little doubt of this coccus or allied species being the cause of the suppuration which often supervenes in certain cutaneous affections not at first suppurative, such as acne, herpes, tinea, and in some cases eczema.

"The actual process by which staphylococcus sets up suppuration seems to be chiefly by its solvent and necrotic action on the tissue elements, and by the injury thus caused to the walls of the blood-vessels, which then permit increased transudation and emigration of leucocytes. It may be plausibly supposed that some enzyme or ferment generated by the bacteria is the actual solvent, but no such substance has yet been isolated.

"Two other species, staphylococcus pyogenes citreus and staphylococcus albus, precisely agree with that just described in form and cultivation characters, differing only in colour. Their pathogenic effect is also the same; some think less powerful, others more so. Staphylococcus cereus albus and staphylococcus flavus, two species discovered in pus by Passet, much resemble the other forms, but in cultivations do not liquefy gelatine. They have no pathogenic effect on animals."

That is the part of the research which I have not gone into except in connexion with the experiments I am carrying out for Sir Joseph Lister.

11,109. While quite understanding that you give no final opinion yourself, should I be right in believing that the fact of erysipelas occurring subsequently to vaccination has been traced by some authorities to the presence of staphylococcus pyogenes in vaccine lymph?—I am not aware of that; I have never found streptococcus pyogenes in vaccine lymph. In the first place I may say that there is a good deal of doubt about the nature of the contagium of erysipelas. There is a special organism, streptococcus erysipelatosus, which produces on inoculation an erysipelous redness.

11,110. (Professor Michael Foster.) Is not streptococcus erysipelatosus supposed to be quite distinct from staphylococcus pyogenes aureus?—Quite distinct.

11,111. (Dr. Collins.) Could you give me the number of the lymph in which you found staphylococcus pyogenes aureus?—It was found once in human vaccine and

once in calf vaccine, but I am afraid I shall have to refer to my notes for the other cases.

11,112. I will ask you the general question whether it is your opinion that any disease which has been alleged to be communicable by vaccination has been proved to be associated with a cause which can be detected in the vaccine lymph?—There are some statements referred to by Pfeiffer who had gone into them, I think, in reference to the Asprières disaster.

11,113. What would you say as to syphilis?—We know nothing about the etiology of syphilis.

11,114. Tubercle?—I am not aware that the tubercle bacillus has ever been found in vaccine lymph.

11,115. Would it be possible to identify the tubercle bacillus by a quarter of an inch power?—It would be impossible by the ordinary methods of examination. Possibly with a very fine quarter inch and an excellent substage condenser a very skilled microscopist might detect it, but it could not be detected in lymph with a quarter of an inch power as employed in the ordinary way by pathologists.

11,116. Would you hold it to be possible for any pathogenic micro-organism to exist in vaccine lymph and to be undiscoverable by a quarter of an inch objective?—It is impossible unless you took them *en masse*, you could not see them individually with a quarter-inch objective.

11,117. They would require cultivation?—They would require cultivation.

11,118. Is there any way of determining by means of the microscope any difference between lymph which contains the virus of syphilis and lymph that does not, so far as you are aware?—No; we do not know the nature of the contagium of syphilis at all.

11,119. (Mr. Bradlaugh.) Do I understand that lymph might be tested by any test you are at present able to apply, and that you would be unable to distinguish between a lymph which was harmless and one which might be harmful to the extent of communicating syphilis?—We have no known test by which we could possibly distinguish.

11,120. (Professor Michael Foster.) Have you made cultivations simply of the surface of the scurf skin?—No.

11,121. I suppose you would get a considerable number of organisms if you did that?—No doubt.

11,122. Something corresponding to those upon your diagram?—Very much so, no doubt.

11,123. (Sir William Savory.) In your answer to Mr. Bradlaugh you were referring to cultivation?—I was referring to the microscopic test.

11,124. You were dealing with part of the evidence, not the whole?—I was answering the question as a bacteriologist.

11,125. I only wanted to make it clear that in saying there was no possible means of discriminating between two lymphs you were referring to part of the evidence, and not to the whole?—That is so, to the bacteriological evidence.

11,126. (Mr. Bradlaugh.) Do you know any kind of test of any character whatever which you could apply to a lymph tube which would enable you to ascertain that it was harmful to the extent of communicating syphilis?—No.

11,127. (Sir William Savory.) But if you took into account the patient from whom the lymph was taken you might obtain evidence, I suppose?—I do not think you could in all cases, but I am only speaking from my general reading.

11,128. (Professor Michael Foster.) You have no experience yourself upon that point?—No.

11,129. (Sir William Savory.) You have not studied the subject clinically?—No, not clinically.

11,130. (Dr. Collins.) Can you refer me to any previous work which has been done upon the same extensive scale with reference to micro-organisms discoverable in various vaccine lymphs?—No; the reason why I have carried out this research is that it was a subject which required to be thrashed out. Pfeiffer's paper is fairly complete. Buist published a book, but unfortunately his results have no bacteriological value at all, because he totally misunderstood the method of separating the micro-organisms in pure cultivations he was quite unacquainted with the technique, therefore his results are, pathologically speaking, useless.



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11,131. (*Chairman.*) You do not, I understand, put yours forward as complete?—This inquiry I started nearly three years ago I regard as finished completely; the second inquiry, with reference to testing the pathogenic effects which I want to work in connexion with some work I am doing for Sir Joseph Lister, is not complete.

11,132. You would believe that you have obtained a knowledge of all the micro-organisms to be found in any vaccine lymph?—There are numerous species, but I think I may say that I have thrashed out the bacteria in vaccine lymph.

11,133. (*Dr. Collins.*) If his Lordship's question were qualified by the words "with our present method of cultivation," would your answer be an unqualified yes?—Yes, but these methods may not be sufficient; for all we know the contagium of cow-pox may not be a bacterium at all; or it may not be cultivable in the media that we possess, but the other day I was thinking over some of these experiments, and I think I may say that they are more complete than they would appear at first sight, because one medium which I have used is glycerine agar agar. If, for instance, an organism like the tubercle bacillus had been present I should have found it. A bacteriologist might criticise these experiments and say, you have only used agar agar and gelatine; but that does not apply, because I have used the glycerine agar agar upon which the tubercle bacillus grows, and if it had been there I should have found it.

11,134. (*Professor Michael Foster.*) In what respect do you say your results are more complete than Pfeiffer's?—Because he says he cultivated some bacilli from vaccine-lymph and did not take the trouble to work them out.

11,135. (*Sir William Savory.*) As the matter at present stands, do I understand you to say that you would draw no practical conclusion from these facts?—I think the practical conclusion is that, so far as we can rely on the media, the contagium of cow-pox is not a bacterium.

11,136-7. Would you even go so far as that; do you think your inquiries have been sufficiently exhaustive to make a negative result of that sort certain?

(*Professor Michael Foster.*) You have a definite meaning for bacterium, have you not; you do not mean to say that contagium is not a vivum?—I am using "bacterium" in its biological sense.

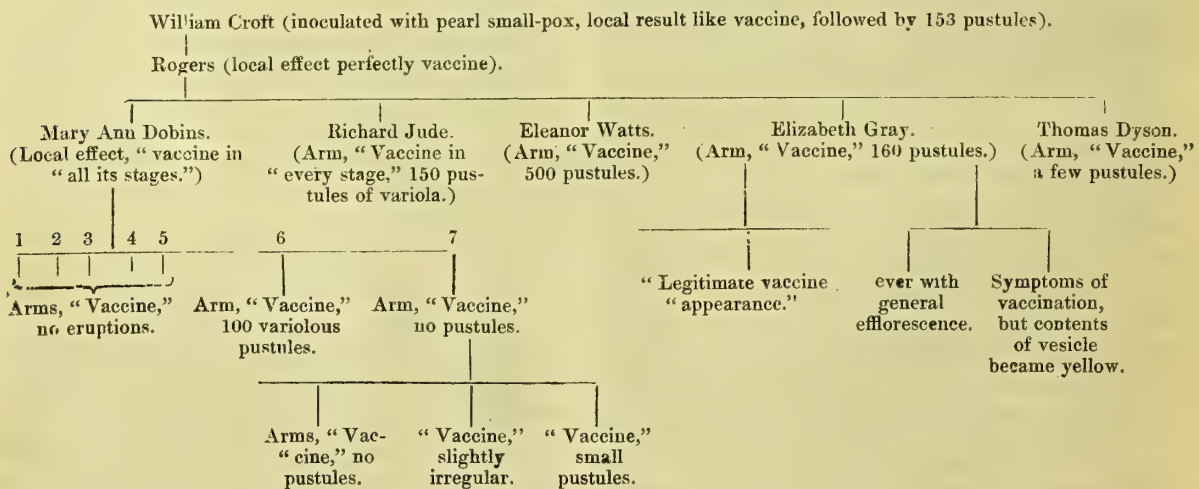
11,138. (*Sir William Savory.*) As far as I can understand your conclusion, you believe that the contagium of cow-pox is not a bacterium?—Yes; that is qualified by saying as far as the experiments go, and so far as the media can be trusted, the contagium is not a bacterium.

11,139. Then you do not offer the Commission any other practical conclusion than that; there the matter at present stands?—That is so; in that respect my research is of little use to the Commission, but in other respects it may be of assistance.

11,140. (*Chairman.*) The next heading under which you propose to classify your evidence is "Mild small-pox and variola vaccine."—Yes; I have been endeavouring to put in my evidence in logical order. Now, as I said just now, when I investigated the literature of vaccination, I found that the prevalent idea that all the lymph was derived from cow-pox and nothing else was erroneous. That is borne out by the question that Professor Foster suggested just now, whether I thought that one of these lymphs was Badcock's lymph. I therefore propose now to pass to a consideration of the statements which have been made with regard to "vaccine" being derived from variola without having passed through the cow. I will refer first of all to Adams' experiments. Adams in his work on "Vaccine Inoculation," in dealing with the question of variolous inoculation, says (page 8): "The principal points are to inoculate with recent virus taken in an early state of the pustule, whilst the fluid is still limpid," and then he discusses a particular kind of small-pox from which the lymph may be taken and he made this statement (page 20): "There is reason to believe that the success of the Suttons was at first greater than subsequent records can produce, either in their own practice or that of others. We shall hereafter consider how far it is probable that chance assisted those as well as other discoverers in a manner unknown to themselves." He mentions a very mild outbreak of small-pox which Dr. Jenner described, and he refers also to the researches of Sydenham, and from the description that was given he called that kind of small-pox the pearl sort. Then he says (page 26): "It is desirable to secure a favourable eruption should such occur, and it seems confirmed by experiments that there is more uniformity between the matter inoculated and the disease produced than has hitherto been supposed. By continuing with great caution to inoculate at the hospital from pearl small-pox, and afterwards by selecting those arms which had most the appearance of cow-pox, we at last succeeded in procuring a succession of arms so nearly resembling the vaccine that an universal suspicion prevailed among the parents that they were deceived by the substitution of one for the other."

11,141. (*Chairman.*) What is the date of that?—The date of that is 1807. "This will be readily understood from the following register," and from the register I have put the cases in the form of a table. Adams selected a case of pearl small-pox, and produced from it a local result like vaccination, but followed by 150 pustules. Then he inoculated Rogers, who had only a local vesicle that looked, he says, just like a vaccine vesicle, and then from Rogers he inoculated five patients; in one there was a "vaccine vesicle" only; in the next the arm was like vaccine, but there were 100 pustules on the body; in the next the arm was vaccine, but there were 500 pustules on the body. Then from those cases he selected the case in which there was the local vesicle only, and from it he vaccinated five children, and the result is shown in my table as follows:

#### Adams' Cases (Variola-Vaccine).



Now, in answer to a question asked me before, as to whether these were all Adams' cases, I said I thought they were, and that I had included them all in my

book; those are all the cases he gives in his "Morbidity Poisons," but in the appendix to "Vaccine Inoculation" I find he gives some more cases; he says



(page 153): "But the following series of inoculations have so satisfactorily proved that a mild small-pox may be perpetuated by successive insertions that until any contradictory evidence appears the question must be considered as decided." That is from his book entitled "A Popular View of Vaccine Inoculation." He then gives the cases; it is very interesting to follow these cases.

11,142. (*Chairman.*) Are they parallel to the cases you have already cited?—Yes.

11,143. Because in the cases you have already cited in the second remove from the original inoculation, though in some cases you have only a local vesicle, you have a considerable number of pustules?—Yes, 500, and then in the next remove it goes to 100, and in the next remove in some no pustules, in others "slight," and "small" pustules.

11,144. Five out of the seven had the local vesicle only, but the others had pustules?—In 11 out of the 22 cases inoculated there was a local vesicle only.

11,145. But how as regards the later list?—I have not counted them.

11,146. Does he ever get the result that all of those inoculated had the local vesicle only, without pustules; or is it only a proportion of them that had it?—He himself concludes by saying that they are not entitled to a degree of confidence as to the probability of their retaining a permanent character; he cannot guarantee apparently that they will retain that character, but he gives those cases which were as far as popular prejudice allowed him to go.

11,147. (*Mr. Meadows White.*) Do the other cases carry that any further?—No, I think not.

11,148. (*Professor Michael Foster.*) The third remove is the last, is it?—The fifth remove is the last.

11,149. In the fourth remove there are still pustules?—In the fifth remove there is one case of small pustules.

11,150. (*Sir James Paget.*) Did he ever succeed in removing it to so great a distance from the first as to produce only the local vesicle?—Apparently not. Then the next cases I wish to refer to are those which I have already mentioned, published by Guillou, and referred to as follows in the London Medical Repository and Review, page 426, 1827. "Having no vaccine virus during a very fatal small-pox epidemic, he took on the 17th of December some variolous matter from a girl 15 years of age on the fifth day of the eruption, and he inserted it in ten places on the arm of a healthy infant still at the breast. This inoculation, M. Guillou says, produced ten beautiful vaccine vesicles, with which, on the ninth day, 42 infants were inoculated under the eyes of two local authorities; these furnished virus for the inoculation of 100 who were inoculated on the 3rd of January in the presence of the magistrates and many medical men." He thus claims to have made the vaccine virus out of variola, that is to say, without passing through the cow. In a second letter he says, "The numerous vaccinations (inoculations with variolous matter) effected since my discovery confirm more and more the perfect identity of the variolous with the vaccine virus. I am convinced that the variolous matter has more energy and activity than the vaccine since it is very rare to fail with it, even in the depth of winter. Every point in which matter is inserted proceeds well, and in their intervals in many individuals an eruption of variolous pustules takes place and produces fever."

"It is essential to observe that all the individuals who have been thus vaccinated remain safe from variolous infection." (*Journal Général de Médecine*, Février, 1827.)

11,151. (*Professor Michael Foster.*) You speak in your book of raising it from cultivation; what was the cultivation?—Successive transmission through human subjects.

11,152-3. Do you know what his thesis was? His case was that this girl, having small-pox after vaccination, was suffering from what at that time and since has been called varioloid, and his thesis was that varioloid could be transmitted as vaccine by inoculation. He was not contending for any particular form of small-pox, but he wished to show this, that the varioloid was transmitted as vaccine?—That is what Adams held.

11,154. Adams took natural small-pox, did he not?—Pearl small-pox.

11,155. Not after previous vaccination?—No, he took ordinary mild small-pox.

11,156. The essential point in Guillou's case was that he was dealing with small-pox after vaccination, and that the vaccination had so modified the small-pox that when he inoculated from the pustules he produced not variola but vaccine?—I maintain that his cases confirm Adams' results.

11,157. They were different from Adams' result; the contention on Guillou's part was that the vaccinia so modified the variola that when the variola did occur after vaccination in the form known as varioloid, that varioloid, when communicated by inoculation, was vaccinia and not variola?—If he had known of Adams' experience with pearl small-pox he might have thought differently.

11,158. (*Chairman.*) They were dealing with what in their view were different things; Adams was dealing with the inoculation of a form of natural small-pox of a mild character. Guillou supposed he was dealing with a case of small-pox modified by previous vaccination?—Yes; and the point I maintain is that they got very much the same results.

11,159. (*Professor Michael Foster.*) Guillou frequently got eruptions?—He says so.

11,160. All over the body?—Yes.

11,161. Do you know that the paper of Guillou's was followed by rather a large and elaborate paper by Gendrin in which he goes into an elaborate description of the results of inoculating varioloid, saying that you sometimes get eruptions and sometimes, as in the case of natural small-pox, you do not?—I have not been able to go to the original paper.

11,162. But that is a different thing from raising it by cultivation?—Surely you would not deny that it was small-pox, whether you call it varioloid or anything else.

11,163. Your account gives it to be entirely that Guillou had selected different cases of small-pox, and by cultivation had acquired a form which gave only the physical character of the vaccine vesicle?—No. There is not anything misleading in my statement at all; I have mentioned that Adams inoculated from mild small-pox, produced certain results, and then Guillou inoculating no doubt from mild small-pox produced similar results.

11,164. (*Chairman.*) In Guillou's case it was nothing like cultivation at all, was it? It was a simple taking of matter from a person suffering from small-pox after being vaccinated. The first use of the matter seems to have produced precisely the same results as the subsequent use. What is there in that that you would use the term "cultivation" for?—Simply the successive inoculation of human subjects from arm to arm.

11,165. (*Professor Michael Foster.*) In the first case he made ten punctures of the infant on the breast and then he had ten separate boutons, and that was what gave him typical vaccine?—I thought you said he had pustules in the first case.

11,166. I have no record of that, it was afterwards that he had pustules?—The statement I have made in my book is this, "It was not until many years afterwards that Guillou also found that a vesicle with the physical character of the vaccine vesicle could be raised from small-pox by cultivation." I think that statement is borne out by the statements I have given.

11,167. All that Guillou wished to establish was that when variola was so far modified by previous inoculation as to give what you call varioloid when you inoculated from that you got not variola but vaccine?—The abstract says that he took virus from small-pox and got vaccine.

11,168. Have you taken the trouble to read the original paper by Guillou?—I have not read the original paper; I tried to get it and I hope to get it.

11,169. You will find it in the "*Journal Général de Médecine*," volume 98, for the year 1827, page 239?—I have the reference myself, and I think your criticism is only a verbal criticism which does not affect the matter at all.

11,170. (*Dr. Collins.*) I gather you consider that Guillou's varioloid was actually equivalent to Adams' pearl small-pox?—That is so.



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11,171. (*Chairman.*) What is it in Guillou's experiments that you refer to as "cultivation"?—That he carried on the lymph from arm to arm through several subjects; I am using the term in the same sense as that in which Adams used it.

11,172. But Adams suggested that he did not, that he got it milder by carrying it on and on?—Yes.

11,173. That I understand to be "cultivation," but in Guillou's case as far as I understand it he obtained as mild results in the first instance, as he ever did afterwards?—From the abstract I do not think so. If such a thing happens as a second edition of my book, I shall have read the original paper very carefully, and if it is defective in that respect, I shall alter it. But "cultivation" does not mean that the results are necessarily milder. They may be the reverse by cultivation.

11,174. (*Mr. Meadows White.*) Adams never succeeded in entirely eradicating the tendency to pustules?—He never decided the case one way or the other.

11,175. From what you read it would seem that in the first cases he got a pustular development?—Yes; but I gather from Adams that he believed he could do so, and was endeavouring to do so.

11,176. (*Professor Michael Foster.*) But there is no evidence, is there, that he succeeded?—Only his cases.

11,177. (*Chairman.*) Have you concluded all you have to say upon the mild small-pox and the variola vaccine?—Yes.

11,178. Your next heading is, "The Pearson-Woodville lymph"?—Yes; I would first of all draw the attention of the Commission to the fact that in 1798, after Jenner had published his book, the stock of lymph that he had used was lost. The pedigree of his lymph is found on page 274 of my Volume I.; he inoculated some children—it ended with J. Barge—the stock was lost then. He had also taken some of that lymph to London, and had given it to Mr. Cline, and Mr. Cline inoculated a boy, and from that boy two children, and the two children failed to take; so that Jenner's lymph was quite lost. That was the state of affairs at that period shortly after the publication of his Inquiry. There were at that time many anxious to try the new method of inoculation recommended in Jenner's Inquiry, but there was no lymph in existence where-with to carry on the experiment. At this juncture Pearson and Woodville came to the rescue. In January 1799, Mr. Wachsels having obtained intelligence that the cow-pox had broken out among cows in Gray's Inn Lane, reported it to Woodville, and Woodville then carried out a long series of inoculations. A table of those inoculations is given in my second volume. Now, the point about these inoculations is, as I have expressed it in my book, that the small-pox had somehow or other been introduced into the constitution as the result of vaccinating either with a variolous lancet or from vaccinating in the variolous atmosphere of the hospital. As a matter of fact, these cases of Woodville were vitiated by the existence of small-pox. Two views may be taken with reference to those cases, one view being that he inoculated concurrently both cow-pox and small-pox. That view is commonly taken from the fact that in some cases he produced only the local vesicle; but inasmuch as Guillou and Adams sometimes produced only the local vesicle, I am inclined to believe that all those cases of Woodville's were really variolations and not vaccinations. Now this is of very great importance, because this lymph was the current "vaccine" lymph used very largely not only in this country, but on the continent; I have, therefore, traced as far as I could the circulation of this lymph.

11,179. You alluded in support of your view to the fact that Guillou obtained only these local pustules; but if Guillou obtained local vesicles when he inoculated from the virus obtained from a small-pox patient who had been previously vaccinated that would not have been necessarily contradictory, would it, of Woodville's cases where there had been no previous vaccination?—No. If you refer to page 137 of Volume II., some would call that case of Butcher (No. 13), for instance, as there were no pustules, a vaccine case; but if you take the trouble to carefully follow that case you will find that from Butcher material was taken for the inoculation—of Jewel, no pustules—of Bumpus, producing 310 pustules; of West, producing 20 pustules; of W. Hull, producing 200 pustules; of H. Hull, producing 8 pustules; and of S. Hull, producing 120 pustules.

11,180. I am not quite sure that I understand that he inserted the small-pox virus?—My belief corresponds with the facts that I shall lay before you. The belief that was generally accepted afterwards was that Woodville's cases were really one of two things, either cow-pox mixed with small-pox or pure small-pox.

11,181. Mixed in what way if they were pure small-pox; do you mean introduced by him?—Yes, when he took his lymph from the cow some suppose he used a lancet infected with variolous virus, and therefore he inoculated both cow-pox and small-pox at the same time. He himself afterwards admitted that the pustules were variolous, and explained them as the result of inoculating in the variolous atmosphere of the hospital. But it was not a question clearly of the variolous atmosphere of the hospital in each case, because, as we shall see, Woodville sent his lymph into the country, and there they got the same results.

11,182. (*Mr. Meadows White.*) In Woodville's cases, at page 100 of your second volume, in the second part of the paragraph which precedes the first case, I find: "Monday, January 21st, 1799, I took the matter of 'cow-pox in a purulent state upon the teats of a cow, 'with which I immediately inoculated seven persons 'by a single puncture in the arm of each, or rather by 'scratching the skin with the point of a lancet till the 'instrument became tinged with blood.' Then follow the cases?—Yes, that is what he did, and the lancet may have been contaminated.

11,183. Then he afterwards inoculates these same people with variolous matter upon the fifth day?—Yes, I think if you will allow me to continue my statement I shall make the matter quite clear.

11,184. (*Professor Michael Foster.*) Do I really understand you to say that, in your opinion, in the very first case in which Woodville conducted so-called vaccination at the small-pox hospital with matter derived from that Kentish Town Farm, he used a variolous lancet and produced variola and not vaccinia?—I do not say in the first case, because in that case there were no pustules, but it may have been so even in that case, because later we get a local vesicle only and cases inoculated from that vesicle had variolous pustules.

11,185. Do you think that Woodville, acquainted as he was with the character of the local inoculative pustule, could have been so mistaken as to think that that was the vaccine vesicle that was described by Jenner?—If you will allow me to give my evidence you will find that they expressly state that they could not distinguish them. There are a great many of these abstracts that I should like to get in if possible to-day. I have pointed out that there was no lymph for people to try this new method of inoculation with, but Pearson and Woodville raised a stock which they called "cow-pox"; this is the way it was circulated: Pearson sent out Woodville lymph to more than 200 practitioners with a letter dated March 12th, 1799, saying: "I hope you will pardon me for taking the liberty to inform you, by way of additional evidence to the testimonies I have published on the subject of the cow-pox, that upwards of 150 patients from two weeks to 40 years of age, principally infants, have been inoculated since the 20th of June last by Dr. Woodville and myself separately."

"(IV.) None of the patients, namely, above 60, hitherto inoculated for the small-pox subsequently to the vaccine disease, took the infection."

"(VI.) In many of the cases eruptions on the body appeared, some of which could not be distinguished from the small-pox." Then Pearson says: "I have sent the matter of the cow-pox pustule on the thread enclosed, in order, if you approve of the inquiry to inoculate with it, I entreat you to favour me with the result of your trials; but I must trouble you to apply the test of inoculation with variolous matter subsequently to the vaccine disorder."

11,186. What is the evidence that that was Woodville's lymph? Did not Pearson himself find cases of cow-pox in other farms in the neighbourhood of London? If you refer to Pearson's writings I think you will find that he found other cases of cow-pox besides the one in Kentish Town which started Woodville?—I have called it "Pearson-Woodville vaccine," because it was commonly called "hospital matter"; it was not distinguished.

11,187. But I was asking this: What is the evidence that any other vaccine than that employed by Wood-



ville at the Small-pox Hospital was in any way mixed up with variola?—The results they had.

11,188. What is the evidence that that matter which Pearson speaks of distributing was exclusively either lymph from the Small-pox Hospital or lymph from the Euston Road source?—I take it that they were all sent out from the Small-pox Hospital.

11,189. What makes you think that?—Because Pearson and Woodville were the physicians to the Small-pox Hospital, and Pearson sends out a thread with a letter, and it is followed by the same results as they had at the Hospital.

11,190. (*Chairman.*) Does he say whether he got that from the cow, or whether it was humanized?—He referred to the results that they had at the Hospital in which the lymph produced pustules, and then he sends these practitioners the same lymph. But I think if I may make my statement right through, the bearing of it will be clear. Pearson then informs us that “at the same time” and in the course of the year I extended the dissemination of vaccine matter to Germany, as can be shown by letters and reports from Madame Neale, from the Princess Louise at Berlin, of Messrs. Balhorn and Stromeyer, of Hanover, of Dr. de Carro, Dr. Ferro, and Dr. Frank, of Vienna; and to Geneva, as it appears from the letters of Dr. Odier; to Portugal for the Prince Regent, by Mr. Correa de Serra, and by Mr. Murphy; to America through the hand of Drs. Waterhouse, Currie, Hossack, Chichester, Mitchell, and others; to Paris and other parts of France on the application of M. de Lioncourt, and the Medical Committee of the École Médicale; into the British Army, through Mr. Keate.

“The sensation excited on the continent by the vaccine practice has been much more considerable than in our own, which I learned first from Dr. Marcet, and since by a letter from Dr. Peschier. At Vienna Dr. Ferro inoculated two of his own children with vaccine matter which I transmitted, and next Dr. de Carro inoculated two of his own children. The above patients had the disease in the usual mild way, and were subsequently inoculated for the small-pox, but without effect. These experiments of inoculation for the cow-pox commenced at Paris on the 2nd of June when 30 children were inoculated with matter received from London agreeably to the directions sent over by Dr. Pearson.”

In July 1800 Woodville went to Paris and on his way inoculated three children in Boulogne. With the Boulogne matter he inoculated Dr. Colon's child and many others in Paris. The new virus was sent to Dr. Odier, for the matter sent by Jenner to Dr. Odier produced according to Husson (*Récherches sur la Vaccine*, 1801, page 78) the spurious cow-pox. Pearson introduced it into America also through Lettson, and it was introduced into Wales through Dr. Turton. Now in contemporary medical journals I have endeavoured to track the “hospital matter” as it was called, or as I call it the “Pearson-Woodville lymph.” In the first set of cases, Ward's cases, I believe that Pearson-Woodville lymph was used, for this reason, that these cases are reported on July the 12th, 1799, and we know that Pearson sent out lymph to the different practitioners at this date; therefore I look upon Ward's cases as inoculations with the Pearson-Woodville lymph. In the other cases I shall refer to the source of the lymph is definitely stated.

11,191. We have had the whole of Ward's cases, they will be found in Dr. Creighton's evidence; he gave an abstract of them first, and he gave them upon a later occasion owing to certain questions which were put with regard to them?—I want to put before you the view I hold of these cases. Take the first case, Martha Ward, she had very much the same result, 1,800 pustules, as the cases at the Small-pox Hospital. It is a very short summary of those cases and explains my view if I may be allowed to put it in.

11,192. We need hardly have that in, but any comments you have to make upon his cases you might make?—I maintain that in Ward's cases the variolous pustules are to be explained by the use of the Pearson-Woodville variola-vaccine. The next cases we come to are three cases of inoculation with variola-vaccine by Dr. Redfearn, of Lynn, Norfolk, reported in the “Medical and Physical Journal” of August, 1799: Case I. March 20th, 1799. Ripper, a boy 3½ years, inoculated with vaccine matter received from Dr. Pearson. The results were as after inoculated small-pox: “an erup-

tion appeared upon the face, hands, and back, although not more than 40 pustules were found upon the whole surface of the body. Lymph taken for future use.” Case II. A girl, aged 11 months. On the 11th day an eruption appeared upon the face, neck, hands, and legs extending itself also over the whole surface of the body, and the patient was extremely restless and uneasy. 16th day “assumed a pustular form” and was “perfectly analogous to the variolous disease.” Case III. Monday, April 4th. Girl, Partridge, 3½ years of age was inoculated with matter from the boy Ripper. Headache, chilliness, flushings, &c. “On 10th day after inoculation a few eruptive spots were observed upon the face and hands, not more in number than five or six.” These three cases were inoculated a second time with variolous matter; there was no result; not the least discolouration of the incisions.

Then the next cases we come to are Evans' cases, they are reported in the “Medical and Physical Journal” on Sept. 11, 1799. It was Pearson's lymph. They are as follows: “Received thread impregnated with cow-pox virus from a respectable surgeon in the neighbourhood of Birmingham (Mr. Addington); inoculated two patients (whose cases are here related).” May 4th. Thomas and Mary Leicester, of 2½ years and four months respectively. May 18th. Vesicle full of limpid fluid, about a dozen pustules surrounding the parts. 19th. The girl had many distinct pustules in different parts of her body. From arms took matter to extend the practice. Inoculated 68 patients from three months to 22 years, of whom 39 had an eruption. “After they were all recovered I inoculated 12 of them with active variolous matter without effect. I had no opportunity of inoculating a greater number with variolous virus owing to the parents of the patients being so well satisfied with the first inoculation from its similarity to the small-pox.” Writing to Dr. Woodville, Evans says, “The vaccine virus which I received from Mr. Addington was originally sent to him by Dr. Pearson of St. George's Hospital. The appearance of an eruption in the two first patients surprises me greatly, as well as those subsequently inoculated, till I read your reports, when my mind was relieved.” (*See Question 11,227.*) The next cases are those of the Rev. Mr. Holt, communicated by Mr. John Abernethy. (“Medical and Physical Journal,” 1799, November 9th.) Out of some 300 cases; William Neil, 10 years, Hannah Beal, 6 years, each about 100 pustules “in different parts of their bodies which assumed precisely the appearance of that given by inoculation except that they were smaller. Six were inoculated with variolous matter; a considerable degree of inflammation appeared in all their arms but no pustule.” Pearson sent lymph to Mr. Stewart, who had 43 successful cases. He relates the particulars of five of them, No. 2 had eruptions; they were inoculated with variolous matter without effect. No. 1 had no eruption; the variolous inoculation had the appearance as if the infection had taken. The results in No. 3 were similar to those in No. 1. The following is an extract from the “Medical and Physical Journal” of February 1800. “In the course of my practice, the latter end of February and in March following, I distinctly recollect four cases in which I first saw eruptions from the vaccine inoculation, resembling so much those of the small-pox, that I should not have hesitated to consider them as belonging to this disease if I had not excited them by a different poison from the variolous.” Pearson gives the following cases: He inoculated a child and there were a few eruptions. Mr. Keate carried matter from this child to Brighthelmstone, where Mr. Barrett inoculated two children, and from one of these Mr. Keate inoculated three. All had the usual fever and all a number of eruptions except one, matter from these was sent to Petworth where Mr. André inoculated 14 children. They all had eruptions like the variolous. 3 had from 3 to 12 pustules, and 11 had from 50 to several hundred. Subsequently Mr. André wrote to Dr. Pearson: “The matter sent from Brighton to Petworth produced a disease in every shape resembling the small-pox, the time of sickening, the symptoms, the eruptions and their maturation were the same. The number inoculated was 14, three of these were children at the breast, the number of eruptions in them was from 3 to 12. The ages of the remaining 11 were from 3 to 14, and the numbers of the eruptions from 50 to 1,000.” Those extracts will be found in the number for December 2nd, 1799. And, again, he says, on April 13th, “A woman caught the small-pox in the natural way and died, but it could not be clearly

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"traced whether she was infected from the inoculated patients, she might or she might not." Then we come to a statement by Ring in the "Physical Journal," 1799, page 28. "I have several instances where the disease was communicated without a possibility of its being received by contact; and where the child from whence the infection came had no pustule but that on the arm, and from good authority I have heard of another instance, where the infection was caught from one who had a considerable eruption."

Next we come to a statement by Blair, on Pearson's lymph, in the "London Medical Review," published on the 1st of June 1800, page 421. The title of the paper is: "Cases and Observations tending to prove either the infectious Nature of the Cow-pox or the Fallacy of some Experiments made in London." It is a commonly received opinion that the genuine vaccine poison is not capable of being transmitted from one person to another in the state of effluvia or gas. This persuasion has afforded one of the strongest arguments in favour of the new inoculation, and if demonstrable is undoubtedly a vantage ground of which every practitioner should avail himself who wishes to extirpate the small-pox. Dr. Woodville (to whose benevolent exertions human nature must for ever stand indebted) is the only author, so far as I know, who believes the vaccine disease, under any circumstances, is 'capable of infecting in the same manner as the small-pox'; he has told us in his valuable reports on the subject that the vaccine disorder may be communicated by the 'exhalation' sent forth from cow-pock eruptions." Blair points out that this is disputed, and continues: "Either the matter with which some of the early cow-pock patients were inoculated in London was not the genuine uncontaminated virus, or the vaccine disease is truly infectious and communicable by means of effluvia arising from the pustules." He refers to a case of Ring's with several hundred eruptions not distinguishable from the small-pox; this patient had been inoculated by Pearson with Woodville lymph. Blair and another physician saw the case; there were 700 or 800 pustules, "which so exactly resembled the small-pox that neither my friend nor I could perceive any difference. Some of the reputed vaccine was taken on a clean lancet. Catherine Bath, three months old, was inoculated; infant sickened, feverish, and had a crop of eruptions in different parts of her body, nearly 100. Another infant in the same court, Charles Twycross, caught the infection and threw out some 20 or more pustules." Blair concludes, "This child, therefore, must have been infected by the other without inoculation." Writing again in June 1800 Blair says, "I incline to think there was originally some mistake or other in transmitting the matter from the cow to the first child; perhaps Dr. Woodville or Dr. Pearson used an unclean lancet, i.e., infected with small-pox matter. Since the publication of my paper I have received letters from the two professional gentlemen who attended the cases in Caroline Court, assuring me that they are now fully convinced those children were affected with the small-pox; consequently no person ought to assume that the eruptions which appeared in the two other patients were the effect of the vaccine virus, nor that the cow-pox is a contagious disease. I am desirous this information should be made known to your readers as early as possible, because several indiscreet practitioners, having more zeal than experience, seem solicitous to persuade the world that the genuine cow-pox has often been communicated by effluvia."

Then we come to a further statement by Ring in the London Medical Review and Magazine, July 1800: "If I had at that time entertained a doubt of the cases alluded to by Mr. Blair being variolous, that doubt would have been perfectly removed by subsequent events. Three instances have lately come within my knowledge where the small-pox took place in consequence of the insertion of matter, received as cow-pock matter from the Small-pox Hospital." Again, "Two days ago Mr. Simpson showed me a severe case of small-pox occasioned by a gentleman having inoculated the patient with what was sent from the Small-pox Hospital as cow-pock matter." Again he says, "The question under consideration is of no small importance. By the present mode of practice those persons who are inoculated for the cow-pox are unnecessarily exposed to the small-pox, to which one of them has already fallen a victim. This, it is true, was not immured in the hospital but inoculated with the hospital matter; and we shall endeavour

"in vain to stop the ravages of the small-pox, while it continues to issue in disguise from that polluted source. From that centre it has lately radiated in three, and perhaps in many more directions; but I hope ere long some remedy will be found for this grievance." In a postscript Ring adds, "Mr. Simpson informs me that Mr. Jordan has two other patients, together with that which he shewed me, at this time labouring under the small-pox occasioned by matter obtained at the Small-pox Hospital as vaccine matter." Then, dated September 1800, there are some further remarks by Ring on "variolated matter." He refers to the fact that cow-pock matter at the Small-pox Hospital had in several cases produced the small-pox, he says. "I have since heard of three additional instances where such matter was received from the same quarter. Since writing my last remarks I have made further inquiries concerning a case at Woolwich, and am authorised by my correspondent to say, that Dr. Irwin gave a clean lancet to Dr. Woodville, requesting him to arm it with pure vaccine matter. With this lancet, when returned the doctor inoculated an officer's child, the first who was inoculated with supposed vaccine matter at Woolwich, and produced a case of small-pox attended with considerable danger. This inclines me to believe, that the matter employed by Dr. Woodville is not so pure as he imagines, and, although by his prudent manner of taking it, and avoiding secondary pustules, much of the virulence of the matter is lost, yet it will occasionally show itself again. *Naturam expellas furca tamen usque recurret.*"

11,193. That would seem to suggest that, whilst Woodville supposed he was taking it from the pustules of patients who were suffering merely from cow-pox, he was really taking it from patients who, whether they were suffering from cow-pox or not, were, at all events, suffering from small-pox however contracted?—Exactly so. That is my own conclusion. There is no doubt that their "vaccine lymph" was variolous. I have said in my book possibly cow-pox may have been inoculated simultaneously; but my own opinion is that it was purely variolous lymph.

11,194. (Mr. Meadows White.) Some of the patients were, by way of experiment, inoculated with variolous matter on the fifth day?—Yes, and that may have caused the contamination; there were many explanations given; Woodville may have used an infected lancet; we know now the necessity for being very careful in such experiments. It may have been that the lymph was carried on from one of his inoculated cases who had caught small-pox; but the important point is that, whatever may have been the source of contamination, the lymph distributed all over the country and over the continent was variolous lymph.

11,195. I find Woodville actually takes the matter with which he inoculates this other child from the pustules about the body; that looks very much as if he was transmitting small-pox?—Yes, the important point is that what has been called the "World's vaccine" was really small-pox lymph, in my opinion. I think I have almost exhausted the literature upon this subject, and it is very extraordinary that we get in almost every set of cases the same story as at the Small-pox Hospital.

Thus in Kelson's cases; these were reported in the "Medical and Physical Journal" of 1800. Mr. Kelson says: "Early in last spring Dr. Pearson sent me some vaccine virus with which I inoculated several persons; in two instances only it took effect, on a man and a little girl. The former had an 'eruption' exactly like small-pox of the distinct kind; they took the usual course of variolous pustules, and the man did well.' His wife was inoculated, and she had 'the true cow-pox with only local pustules.' From the woman three children were inoculated, and they 'all had eruptions of the variolous kind, and were very ill during the eruptive fever.' From those I inoculated a few others, some of whom had eruptions and some had not. At this time I was also using matter which originated with the little girl who took it when the man did, and which I soon learnt to prefer, she having the disease in the mildest form possible, and from this in no one instance did eruptions occur, 'in upwards of 100 patients from two weeks old to 80 years.' These cases were afterwards tested with virulent small-pox 'but nothing ensued except local superficial inflammation for the first six or seven days.'"

11,196. (Chairman.) Pearson sent the lymph to a very large number, does it follow that those were



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typical cases, may they not have been exceptional?—They were nearly all the cases that were published.

11,197. But people would not publish those cases now if the anticipated results were found, would they?—I quite see your Lordship's point, but there is no evidence that those cases were published so far as I remember as exceptional cases. Physicians were evidently writing their experiences of the new inoculation.

11,198. (*Professor Michael Foster.*) Surely the case of Kelson, which you have last read, was published to illustrate that you might have in the same lymph something which in one case gave what was absolutely identical with variola while in other cases what appeared might have been absolutely identical with vaccinia. Does not Kelson finish his case by a discussion of how it was that he got, these two different effects, one vaccinia and one variola, from the same matter, do not you remember that?—But this is after Blair's publication, in which he points out that there is something wrong.

11,199. In that communication of Kelson's, which you are now quoting in Volume IV. of the "Medical and Physical Journal," does not he conclude that communication with a discussion as to how it was that from this same lymph he got those two wholly different series of cases?—That is very possible.

11,200. Was not that the reason which led him to make that communication?—It may have been in that case, but I say in those cases, before Blair raised the discussion, physicians were anxious to give their experience of the new kind of inoculation, you will find that is expressly said.

11,201. (*Chairman.*) I forget how many medical men you said Pearson sent the lymph to?—He sent the lymph to 200 practitioners.

11,202. And how many record results?—About a dozen.

11,203. (*Dr. Collins.*) As regards the question as to these results being possibly exceptional, I suppose there would not have been much ground for practitioners anticipating what the ordinary results of the cow-pox would be; they had not had much experience at that time?—There was no occasion for them to discuss it at all until Jenner and Blair pointed out that there was something wrong.

11,204. (*Chairman.*) Then we come to "Harrup, on cow-pox eruptions"?—Yes; this was published in the "London Medical Review" in January 1801. "Having found some difficulty in a former case of communicating the disease with matter not recently taken, I procured a young man to be sent to me who was inoculated with vaccine matter. [Mr. Harrup should have informed us whence this matter was originally received]. With fluid collected on clean lancet, Mary Loveland, 15 years, was vaccinated; the result was extremely mild, and from her the following were vaccinated: Jacob Gordon, a young man; Trye, a child; Smith, a child; James Trigg, aged 40; his son, 8. They had febrile symptoms, and in Gordon and Trye eruptions very much resembling the variolous eruption." Gordon had 70 or 80. The fact as to Trye could not be ascertained. Smith had several. Trigg's son had two on his face, and 12 or 13 around the inoculation pustule. Trigg had every appearance at first sight of a person in the small-pox, about 300, and complained of throat. 25 in all were inoculated; 21 of these had pustules, and except as above stated, the number varied from one or two to 30. Harrup continues: "I had never entertained any suspicion that the disease was contagious, having considered the many proofs published from time to time on the subject as conclusive. How much I was deceived the following cases will sufficiently show." Richard Smith, father of one of the children, reported that his son James had caught the infection. Fever and pustules "regularly dis-

"persed over every part." An infant in the same house not inoculated caught the infection, and had numerous pustules. Some time after Trigg's recovery, his wife, her child, and Carman were infected. In Mrs. Trigg the pustules seemed confluent, but became distinct. In Carman's case, the eruption resembled the confluent small-pox. Both narrowly escaped with life. Since that time Joseph Slut, upwards of 70 years old, caught the infection by living in the Workhouse where several children were inoculated; he had numerous pustules. His brother and Mrs. Smith, grandmother to the children, had violent febrile symptoms, and Mrs. Smith eruptions.

Then we come to Pearson's lymph in Germany. The only reference I can get to that is rather a small one; it is referred to in the "London Medical Review" of April 1800. This is a translation of a letter from Mr. Stromeier, and it says: "This year we have inoculated 40 persons as well with the vaccine matter received of Dr. Pearson as that of Dr. Jenner, all of which went properly through the disease. Betwixt the London and Gloucester vaccine matter it appears to me there subsists an essential difference. The London matter produces frequently an eruption of small pimples, but they disappear within a day or two days at farthest; Dr. Pearson calls these eruptions pimples. The Gloucester matter has never produced this effect here; but it frequently occasioned ulcerations of the inoculated part of a tedious and long duration which the former matter never did; on account of which I now only make use of Dr. Pearson's vaccine matter. Only one of this year's patients has been inoculated for the small-pox; a pustule was produced upon the inoculated part accompanied with a slight surrounding inflammation, but no other effect whatever."

Then we come to the controversy which was raised, and the statements made by Jenner and others who maintained that it was small-pox matter; in fact, in one letter Jenner refers to their sending out small-pox, and calling it cow-pox. There are other statements to the same effect which I need not repeat, as I have given the references to them in my book; but, of course, Woodville stoutly maintained at first that it was cow-pox, and that cow-pox was contagious, and that cow-pox was followed by eruptions. Then when all those cases were reported and criticised, he thought the matter over, and he afterwards admitted that his experiments were vitiated by small-pox. But he also makes another interesting statement with regard to the gradual diminution of the number with pustules that were observed. Woodville says, "I have, however, observed that the result would have been more favourable if the matter used for communicating the infection had been taken from those only in whom the disease proved to be very mild. My subsequent experience has now enabled me to say that this opinion has been confirmed; or that the disease in its progress from patient to patient has actually become much milder. For out of 310 cases of cow-pox which have been since under my care, only 39 had pustules that suppurated; viz., out of the first 100, 19 had pustules; out of the second, 13; and out of the last 110, only seven had pustules."

11,205. (*Sir William Savory.*) In all those cases the question of the diagnosis of small-pox turns upon the eruption produced, does it not?—No; upon the fact that the disease had been communicated to other people by infection.

11,206. But that would be a more uncertain thing; it would not follow that it was not small-pox because it was not communicated to certain other persons; the first thing would be the eruption, would it not?—Yes.

11,207. Then you would add to that that it was contagious; those are the two points which stamp it as small-pox?—Yes, those would be the two main points.

11,208. If there were no eruption and it were not contagious there would be no further proof that it was small-pox?—No.

Adjourned till Wednesday next at 1 o'clock.



## Forty-sixth Day.

Wednesday, 6th August 1890.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

SIR CHARLES DALRYMPLE, Bart., M.P.  
SIR W. GUYER HUNTER, K.C.M.G., M.P.  
SIR EDWIN HENRY GALSWORTHY.  
SIR WILLIAM SAVORY, Bart.  
MR. CHARLES BRADLAUGH, M.P.

DR. JOHN SYER BRISTOWE.  
DR. WILLIAM JOB COLLINS.  
PROFESSOR MICHAEL FOSTER.  
MR. SAMUEL WHITBREAD, M.P.  
MR. F. MEADOWS WHITE, Q.C.

MR. BRET INCE, *Secretary*.

Prof. E. M.  
Crookshank,  
M.B.

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Professor EDGAR MARCH CROOKSHANK, M.B., further examined.

11,209. (*Chairman*.) There is one of the answers given upon the last occasion to which you wish to make some addition?—Yes; it is with reference to Question 11,044. Sir James Paget asked me if I would think the matter over and give him an answer as to whether, in any of the diseases inoculated in animals, the result is not contagious. I mentioned the case of charbon symptomatique, and that holds good, but perhaps we might compare vaccination with inoculation for pleuro-pneumonia. In pleuro-pneumonia, which is a highly infectious disease, inoculation which has been adopted by some produces results which are not infectious. In inoculation for pleuro-pneumonia, what is supposed to be the virus of pleuro-pneumonia is inoculated at the root of the tail, and the result of the inoculation is not infectious.

11,210. Has it been tested enough to make that a recognised fact?—Yes. I should not have time to go into the whole matter; it is a very intricate question indeed, but I would refer the Commission to the Report of the Board of Agriculture upon Pleuro-pneumonia and Tuberculosis.

11,211. (*Dr. Bristowe*.) Who are the scientific writers upon that Report? Your statement is a very important one, and I should doubt whether many persons would consider that the evidence was sufficient to justify the conclusion you suggest?—The evidence is given in that Report; I have read the Report myself, and I should say there was sufficient evidence.

11,212. (*Chairman*.) Is that an inoculation of virus taken direct from the animal suffering from pleuro-pneumonia or is there any process of cultivation?—No; it is lymph taken direct from the pleuro-pneumonic lungs.

11,213. (*Dr. Bristowe*.) Is there any proof that animals thus treated are protected from future attacks of pleuro-pneumonia?—Upon that question the evidence is conflicting.

11,214. If that be so you cannot be perfectly sure that they had the disease which it was intended to protect them from, imparted to them by inoculation?—The view I hold myself is that in inoculation for pleuro-pneumonia a result is produced, but the result is not pleuro-pneumonia.

11,215. At the same time you are not sure that they have given to them the specific disease it is intended to give?—The advocates of this inoculation hold that they do give the disease; at the same time the subject has been thoroughly investigated, and it has not been considered a reliable method.

11,216. (*Mr. Meadows White*.) You are referring to documents?—Yes. The animals are reported to have caught the disease after inoculation, so that this system of inoculation in this country has been set aside for the system of controlling the disease by civil regulations.

11,217. (*Chairman*.) You desire also, I believe, to hand in some abstracts; what are those?—I should like to read passages showing the different attitude at different times in relation to restrictions upon people who might convey small-pox. For instance, in the Suttonian period Moore tells us that: "Even the

"Governors of the Small-pox Hospital broke through their original prudent regulations; whoever applied at their gates were inoculated and suffered to wander through the city of London covered with pustules, and exhaling infectious vapour" (Moore, "History of the Small-pox," page 276). I wanted to contrast that with another passage from Moore, describing an incident which occurred in 1815, showing what a different feeling existed both in the mind of the profession and of the public. In 1815 a woman was "convicted before the Chief Justice and the other judges of the Court of King's Bench. The crime committed was carrying her child, after inoculation, when covered with small-pox pustules, through the alleys and streets in her neighbourhood, and by this misconduct infecting 11 persons with the small-pox, eight of these died in a shocking condition, and a ninth child lost one of its eyes. All these facts were completely substantiated by the parents of the sufferers. The court before pronouncing judgment animadverted upon the conduct of this woman, as clearly illegal and criminal; and positively declared that the exposure of a person in a public place with any infectious disease which endangers the lives of others is a criminal act punishable by law; yet as this was the first indictment for prosecuting this offence, they were induced to mitigate her punishment by condemning her only to three months' imprisonment" (pages 305-6).

11,218. What is the next point to which you wish to refer?—The next paper is an abstract which I had mislaid upon the previous occasion with regard to Pfeiffer's researches upon the contagium of vaccine. I have made a very short abstract, if I may be allowed to read it. It is as follows:

### Micro-organisms in Vaccine Lymph.

#### Saccharomycetes.

*Saccharomyces vaccinae*. Seldom found in human lymph, constantly found in calf lymph.

*Sarcinae*. Found both in human and calf lymph.

*Sarcina lutea*.

*Sarcina tetragonus*.

*Sarcina aurantiaca*.

*Sarcina muscopus*.

*Bacteria* and *Bacilli*. Found only exceptionally in human lymph, but frequently in calf lymph.

*Proteus vulgaris* (?).

Three mice were inoculated sub-cutaneously with a drop of the liquefied gelatine; result negative.

Hauser found that the injection of a considerable quantity proved fatal to guinea-pigs and rabbits. Probably ptomaine poisoning.

*Bacilli*. Pfeiffer also found bacilli which did not liquefy gelatine; these were not investigated.

#### Micrococci.

*Staphylococcus cereus albus*. Found very frequently.

*Staphylococcus pyogenes aureus*. Found occasionally.

Pure cultivations of these micrococci inoculated on the skin of calves produced a rapid local irritation,



followed by vesiculation, but without the classical characters of the vaccine vesicle. The inoculated part was completely healed in three to five days. According to Pfeiffer they explain the so-called false vaccine.

*Micrococcus pyogenes albus.* Almost constantly present.

Numerous others were found, but not constantly present; vaccine lymph being a splendid medium for the growth of micrococci.

"The effect of staphylococcus pyogenes aureus, albus, and citreus, and of streptococci on rabbits has an important bearing upon the practice of vaccination."

"Calf lymph might be tested before use upon children by inoculation of the ear of a rabbit. If after two days no erysipelas occurs in the inoculated rabbit, the absence of streptococci may be considered as almost proved. Two or three rabbits should be inoculated at the same time."

So that my researches bear out Dr. Pfeiffer's, only on the bacteriological side of the question, they are very much more complete.

(Professor Michael Foster.) Does not he say that the staphylococcus pyogenes is very rare in child lymph before the seventh day?

11,219. (Dr. Collins.) I think you found the staphylococcus pyogenes aureus in more than one of the samples you examined?—In some I did.

11,220. Is that the same organism of which you say they occur in the pus of boils and in the abscesses of pyæmia, puerperal fever, and acute osteomyelitis. Injected into the peritoneal cavity of animals, they set up peritonitis, and introduced into the jugular vein, they produce septicæmia and death. When a small quantity of a cultivation was introduced into the jugular vein after previous fracture or contusion of the bones of the leg, the animal died in about 10 days, and abscesses were found in and around the bones, and in some cases in the lungs and kidneys. Similar cocci were found in the blood and pus of the animals." (Crookshank, Bacteriology, page 123)?—That is so.

11,221. (Professor Michael Foster.) Do you find that is the cause of suppuration?—That is a point upon which I would desire to reserve my opinion, because I should have to give a great deal of evidence to answer the question. I think the subject wants working out.

11,222. You have not carried out any cultivation from the scurf skin?—No, I have not.

11,223. In all probability you would obtain a staphylococcus from that?—No doubt, the staphylococcus is almost ubiquitous.

11,224. So that in any scratch you would be likely to find a staphylococcus?—Yes; but you would be more likely to find cocci in lymph, because lymph is a suitable cultivating medium.

11,225. (Dr. Collins.) Would you go so far as to say that the pathogenic or non-pathogenic character of these organisms, the staphylococcus pyogenes aureus in particular, is still involved in considerable doubt?—No.

While dealing with the subject of vaccine lymph I said in my evidence that I had a card with reference to the American vaccine. These were the papers I received with the lymph. Then there is a correction which might be made. I have described the Aldershot lymph as "lymph" that might be a little misleading, because the technical term is "vaccine pomade." This is the "lymph" from which the cultivations were made. Of course the honourable members of the Commission will readily understand how it is that that contains a large number of adventitious micro-organisms; the method adopted is to clamp the vesicle; then to make the lymph and the tissue of the vesicle into a sort of pulp.

11,226. (Chairman.) I forget for what purpose you alluded to this American card?—I was asked (Question 11,105) where the lymph came from, and I said I would look up the card.

11,227. Then you have something further to say with reference to Evans' cases?—I find that in the proof of my evidence the table of cases was omitted. (See Question 11,192.) I should be glad if that might go into the Appendix; it is instructive. (The paper was handed in. See Appendix I., page 406.)

11,228. Reverting to the subject of the Pearson-Woodville lymph, what have you to say with regard to contemporary opinions respecting that?—I am anxious to direct the attention of the Commission to Dr. Ring's treatise on cow-pox.

11,229. What is the date of that?—1801. This is a very extensive subject, and it would take too much time for me to go into the whole of it, but I feel it is such a very important one that I venture to press this subject particularly upon the attention of the Commission. You will find that Dr. Ring in his book gives additional instances of the use of the Woodville lymph, and lays down very clearly that the lymph was not cow-pox really, but small-pox. He begins by discussing each case, and then he points out that "of 302 who had eruptions, 90 had 100 pustules, or more. Twelve of them had 100, one had 102, two had 105, two had 120, one had 140, six had 150, one had 156, one had 165, two had 170, one had 174, 17 had 200, one had 220, three had 250, ten had 300, three had 350, two had 400, one had 430, one had 450, 11 had 500, one had 530, three had 600, two had 650, two had 700, and two had 1,000." (Treatise on the Cow-pox. Ring, page 105.) Then he discusses several questions, but I think I must content myself with drawing the attention of the Commission to the book itself.

11,230. The conclusion at which he arrived was that variolous matter and not vaccine matter had been inoculated?—Yes.

11,231. Was he writing as a supporter or an opponent of vaccination?—He was the great supporter of vaccination, next to Jenner.

11,232. Was it his view that there was no such thing as an inoculation of vaccine matter, or that the particular lymph which had been inoculated in particular cases was variolous and not vaccine?—That the Pearson-Woodville lymph either was small-pox or contained both small-pox and cow-pox, for he maintains that it produced small-pox.

11,233. Do you mean all the Pearson-Woodville lymph or some particular supply of it?—All the lymph that was sent out from the Small-pox Hospital.

11,234. Taken on a particular occasion, do you mean, or always?—Always, apparently; the pustules were really variolous pustules.

11,235. (Dr. Bristowe.) But when there were not pustules he maintains still that the disease was variola?—Dr. Ring does not discuss that point very minutely; his great point is that the lymph was contaminated.

11,236. Ring's opinions are the opinions which are generally accepted now with reference to Woodville's lymph, are they not?—Yes.

11,237. (Professor Michael Foster.) It had been maintained that cow-pox was infectious upon the strength of those cases which had been vaccinated with the lymph from the Small-pox Hospital; and Ring's argument is that those were not cases of vaccine but of small-pox, and were no proof that vaccine was infectious?—But he goes further than that, he speaks of the hospital matter as "small-pox matter."

11,238. But that was his argument, that those cases were not cases of true vaccine, but cases contaminated with small-pox, and were therefore infectious; but the infectious characters of those cases was no proof that the real vaccine was infectious?—That was his argument.

11,239. (Chairman.) But he did not, as I understand, arrive at the conclusion that there was no such thing as infection from the introduction of vaccine matter which had no variolous properties in its composition?—Yes, he did arrive at that conclusion. Then follows Bryce, who was one of the authorities; he, in his work in 1802, and again in 1809, points out that the eruptive disease resulting from the use of the Woodville lymph was really variolous, and Moore, in his work, says that "variolous matter under the denomination of vaccine lymph was spread widely through ignorance and transported to Germany, and even to the Island of Madeira, where a physician described the disease as a pustular disease." And Robert Willan, who was a very great authority, and a physician at the Fever Hospital, says: "I was fully satisfied that the pustules produced under these circumstances were genuine variolous pustules, as many opportunities occurred to me of ascertaining, by inoculations from them, that they were capable of communicating every species of small-pox, from the mild and distinct to the confluent and most dangerous form of the disease." (On Vaccine Inoculation, Willan, page 5.)

11,240. Was there any record as to the mortality in those cases of inoculation, whether it was as great or not as great as from natural small-pox?—I know of no comparison with the natural small-pox, but Woodville

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compared it with the inoculated small-pox. He says, I think, that whereas there was only one death in 800 with "the new inoculation, there was one in 500 from the old "inoculation." That was the chief reason why he advocated it. He also says that the results as a rule were milder; and upon that basis he recommended the new inoculation.

11,241. Can you suggest any reason why it should be milder if it was a mere variolous inoculation?—Because it was a long series of arm-to-arm variolations; and Woodville tells us that when he began to select his cases the numbers with pustules rapidly diminished. I gave the reference at the last sitting of the Commission, and that seems to me to bear out the results that were described by Adams and Guillon. I look upon the Pearson-Woodville cases, the 400 cases of which he gives the details, as really being parallel with Adams's cases and Guillon's cases.

11,242. (*Mr. Meadows White.*) This is in Moore. On the next page to that which you were citing he says (page 302): "Yet an approximation to the truth may be attained by making an allowance for these omissions. "At the commencement of inoculation in England the "proportion of fatal cases appear to have been fully "one in 50, but after the last improvement in treatment had been established probably not more than "one in 200 were lost. Of those who contract the "casual small-pox, and are treated with medical care, "it has been admitted that generally about one in six "are lost; but in countries where the medical arts are "unknown, the small-pox is so fatal a disease that few "of those who are seized with it survive its malignity." That is a statement that by the better treatment under inoculation, whereas it used to be one in 50 that were lost, the proportion is now one in 200?—That is so.

11,243. (*Chairman.*) You have suggested that the number of pustules in Woodville's cases depended upon whether he took the inoculated matter from a mild or a severe case. I observe that in the results of inoculation by matter taken from the same subject there is great diversity, that in one case the number of pustules was large or very considerable, whilst in a number of other cases there were no pustules, or but very few. Does not that suggest a difficulty in accepting the explanation that the number of pustules depended upon the character of the disease in the subject from whom the inoculated matter was taken?—It suggests a difficulty in reference to the earlier cases, but I find no evidence in the early cases of what may be called a deliberate attempt to select the lymph; but in reference to Woodville's later cases I should like to read again what Woodville says. He says: "I have, however, observed that the result would have been more "favourable if the matter used for communicating the "infection had been taken from those only in whom the "disease proved to be very mild. My subsequent "experience has now enabled me to say that this "opinion has been confirmed; or that the disease in "its progress from patient to patient has actually become much milder. For out of 310 cases of cow-pox "which have been since under my care, only 39 had "pustules that suppurated; viz., out of the first 100, "19 had pustules; out of the second, 13; and out "of the last 110, only seven had pustules." (*See Question 11,204.*)

11,244. There the distinction is between having none and having some. He does not give the number of pustules?—No; the distinction is between having none and having some.

11,245. Does that conclude all you have to say with reference to the Pearson-Woodville lymph?—I should like to point out that both Woodville and Pearson acknowledged their mistake afterwards. Woodville in his "Observations on the Cow-pox," 1800, page 21. Pearson in "An Examination of the Report of the "Committee of the House of Commons," 1802, page 49: he says: "It is true that many of those vaccine cases "were conjoined with the small-pox from the influence "probably of the variolous infection, but as the "eruptive cases exhibited the genuine cow-pock on the "part inoculated, and the matter of it very generally "propagated the vaccine without eruptions, in private "practice and in the country, it is fair to admit them "into the class of cow-pock cases." [*Crookshank, Volume I, page 162.*]

11,246. Did he hold that both diseases, cow-pox and small-pox, had been communicated?—That was what was maintained by both Pearson and Woodville; others differed. Had they been familiar with the results

which were afterwards obtained by Adams and Guillon I think they would have admitted that they were altogether variolous; because I have traced very carefully the pedigree of those cases in the second volume of my work, and in some cases you will find local pustule only, (such a case as Pearson would call "cow-pox," yet when inoculations were carried on from that case, pustules re-appeared showing that the vesicle was variolous.

11,247. (*Professor Michael Foster.*) Were not they inoculated with variola very soon afterwards, and had not some of those cases been subjected to a variolous atmosphere?—Yes; it is a very important point that they had been inoculated with variola afterwards and that the variola had not taken: that is what one would expect.

11,248. (*Chairman.*) Do you think that Woodville was unacquainted with the characteristics of a small-pox pustule resulting from the inoculation with variolous matter?—He was perfectly acquainted with them.

11,249. Because it appears from his writings that he must have seen some distinction between the characteristics of what he calls the vaccine vesicle from that which he knew as a small-pox pustule?—He was completely puzzled when he used this lymph; he produced pustules which he says he cannot distinguish from variolous pustules, and when he saw Jenner he told him that small-pox and cow-pox were the same disease. Of course his "cow-pox" and small-pox were the same disease.

11,250. Had he not obtained a vesicle which differed in its characteristics from the small-pox pustule, or was he always under the impression that the character of the two pustules was precisely the same?—I am not aware that he changed his opinion after that.

11,251. (*Professor Michael Foster.*) Does not he make a distinction between the pustule which arises on the one hand from the inoculation of small-pox, or cow-pox, and those cases which occurred at the Small-pox Hospital. Had Woodville any doubt, save in very exceptional cases, as to the pustule arising at the spot of inoculation being either small-pox or cow-pox? Did he not hold the opinion that he could always, save in certain exceptional cases, distinguish between vaccine and small-pox? Let me refer you to the bottom of page 148 of the second volume of your book?—I see that sentence.

11,252. What Woodville was in doubt about was how to distinguish between the pustules of the secondary eruption of his cases, which had been vaccinated, and cases of natural small-pox; he had no difficulty about the inoculated spot, save, as he says, in one or two exceptional cases. But he did not draw any marked distinction between the pustules when considered as a secondary eruption in those cases, and cases of small-pox, but he did draw a marked distinction between the pustule or "tumour," as he has sometimes called it, which occurred at the inoculated spot, and the secondary eruption?—It is very difficult to draw any conclusion from what Woodville says, because he was completely mistaken in his early conclusions, and his statements are very difficult to interpret.

11,253. (*Chairman.*) But dealing with this particular one to which Professor Foster has called attention, does not that show that your answer to me was not absolutely accurate? Woodville says: "The general character of "the tumour formed by the inoculation of the small-pox is very different from that of the cow-pox; and "though on the same day a person be inoculated in one "arm with the matter of the cow-pox, and in the other "with that of the small-pox, yet both tumours preserve "their respective characteristic appearances throughout the whole course of the disease." (*Crookshank, Volume II, page 148.*) Does not that suggest that he did recognise as the result of the inoculation with the vaccine matter a tumour, or vesicle, or pustule, or whatever it may be called, which differed in its characteristics from that which was produced by the inoculation of variolous matter?—My answer is accurate, for Woodville called all his cases "cow-pox," although his lymph was either altogether variolous or mixed with cow-pox. I must ask you to draw a distinction between the vesicles of variola when carried on with selection of lymph from arm to arm and the ordinary result of a primary inoculation, as Adams first pointed out; he pointed out that in his arm-to-arm variolations the local vesicle assumed the character of a vaccine vesicle, and differed from that of the ordinary inoculation from a case of natural small-pox, so that Woodville



would still be correct in saying that in his cases the "cow-pox" tumour differed from ordinary variolation.

11,254. (*Professor Michael Foster.*) But where is the evidence that Woodville always inoculated from natural small-pox, and not from the pustule upon the inoculated spot? He was as familiar surely with the results of inoculation, whether he took his matter from the inoculated spot on the arm or whether he took his small-pox matter from a pustule of the secondary eruption?—We have no evidence of that. On the contrary, Adams, who worked at the Small-pox Hospital side by side with Woodville, brought out his results as something quite new, therefore Woodville could not have known of the results of successive arm-to-arm variolation such as Adams obtained.

11,255. But have you not spent some time in showing us that in the system of inoculation the matter was at all events sometimes taken from what was spoken of as the inoculated spot; that is from the arm that was inoculated?—Yes.

11,256. Therefore it was at least not an uncommon practice in inoculation for matter to be taken from the inoculated spot?—That is quite true.

11,257. Therefore Woodville was familiar with the appearance of small-pox, whether the matter had been taken from the inoculated spot or from the pustules of the eruption?—But you must distinguish between matter once removed and matter a great many times removed, as in Adams's cases; that is the distinction I am making.

11,258. Then what evidence have you that they always stopped at once at this inoculation from the inoculation spot?—There is no evidence that Woodville anticipated Adams.

11,259. Do you think it probable that Woodville had inoculated not more than once from the inoculated spot at the Small-Pox Hospital where patients were continually coming in for inoculation?—I think he was totally unacquainted with such results as Adams obtained.

11,260. What has that to do with it? I understand your argument to be that Woodville, though he might have recognised the character of small-pox when inoculated from the pustules of the ordinary small-pox, was not aware of the character of small-pox when the inoculation had been carried out from a pustule of the inoculated spot through more than one repetition?—That is what I maintain, otherwise Adams would not have published his cases, in which the inoculated vesicle resembled the vaccine vesicle, as something startling and new.

11,261. (*Chairman.*) But people do sometimes publish things as new which have been known before?—But in those days they were so critical that attention would have been drawn to it.

11,262. (*Professor Michael Foster.*) Was not it the case that Adams took a particular form, a particular "sport" of small-pox, and carried that on; but it does not follow from that that they all inoculated small-pox from the same sport as Adams dealt with?—I say that it is very difficult to find the source of error in Woodville's cases, but what I am pointing out is that the cases were vitiated; that his lymph produced small-pox, and that there is not sufficient evidence to say, with Pearson, that in certain cases in which there was only the local vesicle there was only cow-pox, because if you follow the cases on from those with the local vesicle only you again get eruption. One of two things must have happened—that in these cases the vesicle was simply a variolous vesicle, or in the vesicle the two viruses were mixed.

11,263. That would be the case in which Woodville thought he had the power of distinguishing between a vaccine vesicle and a small-pox vesicle?—What he calls the "vaccine" vesicle.

11,264. Do you remember a case reported by Woodville in the "Medical and Physical Journal," in which during an eruption of small-pox occurring after vaccination he saw a variolous pustule appear within what he calls the vaccine tumour?—Yes, that would be one of the cases that would support the view, that the two viruses were mixed in the vesicle.

11,265. (*Chairman.*) In the previous records of the inoculation with variolous matter, was not the result that it was the exception to find no pustules beyond the one at the spot of inoculation, the rule being to find more or less?—Yes, more or less.

11,266. But in Woodville's case he states that a very large proportion of the patients, out of 500 cases, had no pustules. Whatever its cause, would not that be a different experience from that which had been manifested by any 500 cases of admittedly variolous inoculation?—Not if compared with arm-to-arm variolation as in Adams's cases. Adams, out of 22, had 11 cases with only the local vesicle.

11,267. That is half?—Yes.

11,268. Those being carefully dealt with in a particular way?—Yes.

11,269. But Woodville did not deal with them in those 500 cases in any particular way. Why should Woodville, contrary to his previous experience, have had that larger proportion without pustules instead of the larger proportion with pustules?—Because in those cases he is carrying out a long series of arm-to-arm variolations.

11,270. Have you any evidence that he had never variolated from arm-to-arm before?—He may have done so in just a few cases here and there, or now and then at the hospital, but we have no such record of arm-to-arm variolations with the same lymph.

(*Dr. Collins.*) Was it the majority of Woodville's cases which had no pustules?

(*Chairman.*) He says, "A very large proportion."

(*Dr. Collins.*) He says that he was aware that three fifths had pustules and two fifths had not; that is on page 152.

11,271. (*Chairman to the Witness.*) I had gathered from the use of the words, "a very large proportion," that more than half had no pustules; but I observe in a later passage on the same page that Woodville states apparently that about two fifths of all the persons inoculated had no pustules?—Yes. Take the very first cases that Woodville had it is extremely interesting, and it is very difficult indeed to say whether it was a variolous lancet in the first instance, or what was the source of the contamination; he inoculates seven persons with the matter of cow-pox from the teats of a cow, and after that he makes an inoculation from the hand of a dairymaid; so that he had two stocks of lymph. Now, take those very first six cases of his, I say he may have taken his lymph from the teats of the cow upon a variolous lancet; the result in the first case is not very clear, the second case is obscure, but of the third case he says that the "appearances" (was) "more analogous to those of the inoculated small-pox than in the case of Mary Payne." "The vesicle on the inoculated part formed on the third day, and the surrounding inflammation never became phlegmonous, nor was it attended with any hardness of the integuments. Seventh day. In the evening he was discovered to be feverish and restless, when two pustules exactly resembling those of the small-pox appeared near to the inoculated part." (*Crookshank, Volume II., page 101.*) Then there were nine additional pustules, then six more pustules, and altogether 24 pustules. Then in the fourth case there were five pustules corresponding to those in the case of Buckland. The eighth case was inoculated with the matter of cow-pox taken from the arm of Sarah Rice; that was the other stock of lymph, and then he inoculated with small-pox on the fifth day as well; so that we are not surprised to find that in that case there were 300 pustules. Some experiments were subsequently made, I think it was by Willan, in which the two viruses were mixed, and then it was found that a double vesicle resulted, and when Willan took the lymph from the vaccine part of the vesicle, he produced vaccinia, and if he took it from the other part of the vesicle then he produced variola. So too in the Pearson-Woodville cases one of two things may have happened, when there was only the local vesicle it was purely variola, or the vesicle contained both the variolous and the vaccine virus; but Pearson had no right to conclude that when there was solely a vesicle it was only cow-pox, because when inoculations were made from such cases the variolous eruptions re-appeared.

11,272. Were there any of those cases in which the matter inoculated was taken from any patient who was one remove from the patient to whom the disease was originally communicated?—Yes, if you refer to the tables on page 137 in my second volume you have lymph taken from Collingridge to Butcher, and then from Butcher to Jewell, then Jewell's lymph is used for Fisk, and then from Fisk it is used for Davy, and so on, so that we have a regular pedi-

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gree of arm-to-arm variolations. And Woodville, as the result of his later experiments when he had inoculated something like 2,000, says that when he made a point of making his arm to arm variolations from mild cases, the number who had pustules diminished.

11,273. Collingridge had a large number of pustules, namely 170, and Butcher, who is the first remove, had none; Jewell, who is the second remove, had none; and Fisk, who was the third remove, had 40; that does not seem to show that as it got further removed it became milder?—It is not an invariable result I would say by any means. I have never wished to press it that you could be absolutely certain of getting it down to the exhibition of the local vesicle only; Adams said that he could get it down to the local vesicle sometimes, but that you could not depend upon its retaining that as a permanent character. There is another very important point with reference to these cases, that the variolous test was vitiated, it was tried in a number of those cases and they got no results and that is what one would have expected; the patient having already suffered from variola.

11,274. (*Mr. Meadows White.*) There was Dixon's case, the fifth remove; he suffered from 174 pustules?—That is so; on the other hand Jenner, who, as we know, pointed out that early lymph should be used, employed the lymph from one of the pustules in Bumpus, and only in one or two cases had pustules as the result.

11,275. (*Professor Michael Foster.*) What authority have you for saying that they were secondary pustules in Bumpus' case?—I think it is expressly stated so by Woodville.

11,276. Whereabouts?—Not from the secondary pustules; Woodville says the lymph was taken for Jenner from the arm of Bumpus, who had 300 pustules, yet with that lymph Jenner had only one or two pustular cases.

11,277. One or two pustular cases?—Yes; he called them pimples first of all.

11,278. Where is the record of Jenner having pustules?—You must read the controversy which took place between Jenner and Woodville.

11,279. Where is the statement that Jenner saw pustules?—He called them pimples first, and afterwards he called them pustules.

11,280. Where does he call them pustules?—Woodville refers to it in his second publication. I shall have to look up the page. I would remind you of the controversy which took place when Woodville's book upon cow-pox—

11,281. I do not think we need go into that controversy, but will you show me where he spoke of them as pustules?—I will give you the reference,\* but that Jenner actually did so you may gather from this. Woodville in his book reproves Jenner for having altered his statement, and accuses him of making facts "bend a little to hypothesis." . . . red spots are here "changed into pustules." Woodville blamed Jenner for speaking of pustules as pimples or spots.

11,282. (*Dr. Collins.*) Jenner was apparently not in much doubt in his own mind. Did he not write to Dunning and say, "Woodville at that time and his co-adjutor Wachsel knew nothing of the cow-pox; this is clearly evinced by Woodville's first pamphlet" where he gives 300 cases of small-pox and calls them "cow-pox"?—That is so.

11,283. (*Chairman.*) Does that conclude what you have to say with reference to the Pearson-Woodville lymph?—It does.

11,284. Then you desire to communicate some facts to the Commission with reference to the diseases of the teats of cows?—Yes; it is with reference to the diseases of the teats of cows other than cow-pox to which I have been giving attention for some time. I will proceed to enumerate them.

#### Chapped Teats.

Sores on the teats of cows may result from slight injuries, such as scratches from brambles while the cows are out at pasture. Cowmen have informed me that a similar condition arises from the cows soiling their teats

in muddy ponds and being afterwards exposed to dry winds. The same may happen as a result of inflammation of the udder after calving, in the form of excoriations or small cracks or chaps which are very troublesome.

#### Blister Pock, White Vesicle or White Pock.

*Variolæ vaccinae bullosæ* (Gunzel), *bullatæ* (Oslander), *vesiculosæ*, *pemphigoides*; Wasser—or Windpocken (Hering).

This disease is communicable from the cow to the hand of the milker, and is conveyed by the milker to other cows. Jenner described a case in a milkmaid: "On the fingers of each of the girl's hands there appeared several large white blisters; she supposes about three or four on each finger. The hands and arms inflamed and swelled, but no constitutional indisposition followed."

Hering pointed out that the structure of the vesicle is characteristic. There is only a simple raising of the epidermis, and in 24 hours the vesicle has reached the size of a pea or bean. The contents are sometimes absorbed, and the vesicles are found empty. Ceely, also, described these vesicles as sub-epidermic and distinguished from cow-pox in that the cellular character is wanting. When communicated to man, according to the latter authority, the vesicle may resemble in appearance the vaccine vesicle; "but on examination with a lancet, it is found neither cellular nor possessed of fluid contents; it is in a state of desiccation, and has retained this appearance and its integrity so long on account of the thickness of the epidermis."

#### Aphtha Epizootica.

*Fèvre Aphtheuse, Foot-and-Mouth Disease.*

This disease may be mistaken for cow-pox if on the discovery of vesicles on the cow's teats a diagnosis be made without entering fully into the clinical history. It is most important, therefore, when milch cows are affected with vesicles on the teats, that a careful examination should be made for any eruption in the mouth or on the feet.

The best description of this eruption in milch cows is given by Rayer. The number of vesicles may vary from six to forty. They are, at first, about the size of a pin's head, and increase until they form large flattened circular vesicles. The vesicles dry up about the tenth or eleventh day, and a brownish thin crust forms and is detached about the sixteenth or eighteenth day. If subjected to the tractions of the milkers, a superficial excoriation of a brownish-red colour results, covered with a crust consisting largely of dried blood. These ulcerations do not degenerate into phagænædic ulcers like those which occur in cow-pox.

The disease is said to be communicable to man when the milk is drunk while still warm from the cows. Vesicles then make their appearance on the lips and tongue.

#### Cattle Plague.

The eruption of cattle plague may occur on the udder and teats, as well as on other parts of the body. The disease is analogous to human small-pox. From the general characters of this affection there can be no difficulty in distinguishing it from other eruptive diseases of the teats. There is no cattle plague now in this country, as it has been effectually stamped out.

#### Yellow Pock.

This affection was described by Nissen as an eruption yellow from its first appearance, and continuing so. It is accompanied by an extremely unpleasant, almost putrid, smell, and soon ulcerations result, from which pus and blood exude. The disease is communicable from one cow to another and to man, boils and ulcers resulting. Ceely met with an instance in which a milker infected his wife and five children.

#### Bluish or Black Pock.

This disease has been described by Ceely as forming bluish or black or livid vesications on the teats and udders, followed by thin dirty brown or black irregular crusts, and some degree of impetigo in the interstices near the bases of the teats.

\* A continuation of *Facts and Observations*, 1801.—"In a few weeks after the cow-pox inoculation was introduced at the Small-pox Hospital I was favoured with some virus from this stock. In the first instance it produced a few pustules." Jenner.—E. M. C.



## Warts.

These according to Ceely are of two kinds, "long, narrow, pendulous, and linear-shaped prolongations, easily removed and often detached; the other, short, thick, compact, broad elevations, lighter in colour generally than the ground from which they rise, of various sizes, from that of a pea to that of a horse-bean, frequently very numerous on the teats, where they are found bleeding and partially detached."

## Other Eruptions.

Ceely has described "suppuration of the cutaneous follicles at the base of the teats; small, hard knots, cutaneous or subcutaneous, in the same locality, about the size of a vetch or pea, or even larger, which often remain indolent for a time, at length become red, vesicate, enlarge, suppurate, and burst after attaining not unfrequently the size of a walnut or more, occasionally affecting the hands of a milker, and often the other cows milked in the same shed by the same hands; and an eczematous eruption with intertrigo on the udder and near the roots of the teats."

## Horse-pox.

I will discuss this eruption separately.\*

I have brought some diagrams which I thought would illustrate what I have said without desiring to have them published. This diagram represents the eruption of foot-and-mouth disease which may be mistaken for cow-pox, but, as a rule, there is no difficulty in distinguishing it because you have only to open the animal's mouth and you observe the eruption upon the lips; and these represent the other eruptions.

11,285. (*Professor Michael Foster.*) Are the cases you have mentioned the only kinds of eruption upon the teats?—I have enumerated all those that are recognised.

11,286. Are there no other affections of the cow accompanied by eruptions upon the teats besides those in true vaccinia; have you given an exhaustive list of all affections of the udder and teats other than true vaccinia?—It is exhaustive.

11,287. You disregard altogether, I suppose, the opinions which have been put forward by Klein and others with reference to their being at all events more than one disease of the cow accompanied by eruptions upon the udder?—I did not say there was only one such disease.

11,288. Besides those you mentioned and true vaccinia?—I do not understand you at all.

11,289. Why did you enumerate those several diseases upon the teats of cows unless you intended the list to be exhaustive?—The list is exhaustive.

11,290. I find in those no mention of the disease of the cow accompanied by an eruption upon the udder which has been described by Klein and which he contends is not true vaccinia?—Do you mean the alleged cow-scarlatina?

11,291. There are two diseases, I may say, described by Klein. One of which he found occurring at Kingston and another at Camberwell, which he regards as quite distinct diseases both from each other and from true vaccinia?—I have described those diseases which are generally recognised in this country, in Germany, and also in France. It is quite impossible to say what the diseases were that Dr. Klein was describing merely from his descriptions. I have not included the eruption of so-called cow-scarlatina beyond a passing reference, because it may be taken as established that that theory has broken down.

11,292. I fail to see the object of your giving a list of the diseases of the teats and udder unless it is an exhaustive one?—I think it is exhaustive. It includes all the diseases which are recognised beyond controversy.

11,293. That is to say you wish to ignore all the researches of the past few years which have been written on by Klein and others?—Not at all.

11,294. (*Dr. Collins.*) There is the alternative surely, that you would identify some of those diseases with some of those that you have put in your list?—Certainly.

11,295. (*Chairman.*) Which would you identify them with?—Take the so-called cow-scarlatina, I believe that was an outbreak of cow-pox. I do not think I need go into that question. There was a long controversy upon the subject, but the researches as to the existence of so-called cow-scarlatina have not been confirmed. Fallacies in the investigation were pointed out in the Reports of the Agricultural Department, and I may add that the reasons that were given for excluding the diagnosis of cow-pox, as I shall point out, were the very reasons which recent researches in France indicate as reasons for believing that it was cow-pox.

11,296. (*Professor Michael Foster.*) Klein describes two diseases, one of which he found at Kingston and the other at Camberwell, he distinguishes those two diseases from each other and finds that they are not protective against each other. He further distinguishes them from true vaccinia, do I understand that you regard both of those as identical with true vaccinia?—I did not say so.

11,297. Or with some of the other diseases you have enumerated?—They are probably identical with some of those described by Ceely, such as blister-pock.

11,298. (*Chairman.*) Would you now proceed to the statement you desired to make with reference to outbreaks of cow-pox?—I am anxious to put in this statement because it has been held by many that cow-pox is an extinct disease and has been for many years. You may say that within the last three years there have been two schools of opinion, in fact there has been a very warm controversy. I have been upon the side of those who have held that cow-pox was not extinct, and that it was not so uncommon as the other side would believe. I should like to point out a number of discoveries of cow-pox. According to Jenner the cow-pox had been known among farmers from time immemorial. He refers to cases occurring in 1770, 1786, 1782, 1791, 1794, 1796, and 1798. In 1799 cow-pox was raging in the dairies in London, and outbreaks were investigated by Woodville, Pearson, and Bradley. In the same year cow-pox broke out at Norton Nibley, in Gloucestershire. Pearson and Aikin referred to the prevalence of cow-pox in Wilts, Somerset, Devon, Buckingham, Dorset, Norfolk, Suffolk, Leicester, and Stafford; and Barry mentions its prevalence in Ireland.

From this time onwards, for a long period, natural cow-pox received little or no attention in this country. Fresh stocks of lymph were raised for the purposes of vaccination, but no further attention was given to studying the disease in the cow. In 1836 Leese described an outbreak of cow-pox, and in 1838, Estlin discovered an outbreak in Gloucestershire. In 1838-39 cow-pox was met with by Mr. Fox, of Cerne Abbas, and again, in 1839, in Dorsetshire, by Mr. Sweeting. Ceely frequently met with cow-pox in the Vale of Aylesbury, and particularly refers to outbreaks in 1838, 1840, 1841 and 1845. But after this, outbreaks of this disease in the cow were not recorded, though several medical practitioners met with the disease, and raised fresh stocks of vaccine lymph. Thus, when inquiries were made in 1857, it was found that Mr. Donald Dalrymple, of Norwich (on two occasions), Mr. Beresford, of Marlborough, in Leicestershire; Mr. Gorham, of Aldeburgh; Mr. Alison, of Great Retford; Mr. Coles, of Leckhampton; Mr. Rudge, of Leominster; and one or two others had met with outbreaks of cow-pox.

In Italy cow-pox was found by Sacco in the plains of Lombardy, 1800, and by other practitioners in 1808-9. In 1821 it was observed at Naples by Miglietta, in 1830 in Piedmont, and in 1832 and 1843 at Rome by Dr. Maceroni. Quite recently several outbreaks of cow-pox have been met with in this country, and the stocks of vaccine lymph renewed.

In France in 1810 cow-pox was found in the Department of La Muette, and in 1822 at Clairvaux; at Passy, Amiens, and Rambouillet in 1836; at Rouen in 1839; at Saint Illide, at Saint Seine, and at Perylhac in 1841; in 1842 at Pagnac; in 1843 at Deux Jumeaux, where during the previous 30 years several fresh stocks of lymph had been raised and circulated. The disease occurred in a cow belonging to M. Majendie in 1844, and it was found at Wasselonne, in the Department of Bas Rhin, in 1845; it occurred in three other departments in 1846; at Rheims and in the department of Eure at Loire in 1852; the arrondissement of Saucerre, and at Beziers in 1854, and at Guyonville in 1863.

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\* The alleged cow-scarlatina is not included. The existence of such a disease has not been confirmed, and it was probably only an outbreak of cow-pox. Dr. Cameron dismissed the diagnosis of cow-pox on the ground that no papule had been observed nor subsequent formation of pustule, areola, or pitting, and because the vesicles were not umbilicated. (*See Question 11,295.*)—E. M. C.



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It broke out on farms in three villages near Nogent in 1864 (the disease was introduced by newly purchased cows; milkers were infected, and from one of these milkers a lymph stock was established); it also occurred in 1864 at Petit Quevilly, near Rouen; and in April 1866 at Beaugency; in 1881 at Eysines, near Bordeaux; and again at the same place in 1883, and in 1884 at Cerons.

In Germany, as soon as attention had been drawn to the disease, cow-pox was frequently discovered. It was also ascertained that it had been referred to in a Göttingen newspaper published in 1769. In 1802 it was met with according to Büchholz in several different parts of Germany, in Mecklenburg, Holstein, Brandenburg, Silesia, and in the neighbourhood of Gresen and Erlangen. In 1812 cow-pox was discovered in Berlin and its suburbs by Bremer; near Luneberg by Fischer; and in Greifswalde by Mende; in 1816 at Seggerde; in Brunswick by Giesker, and in other parts of Brunswick.

In Holstein, from 1813 to 1824, Luders met with five epizootics in the farms of Büstorf, Berensbrook, Ornum, Eichthal, and Holmstein, and also a great number of isolated cases. Ritter found that this disease was very common in Schleswig-Holstein. It was found in 1829 by Riss at Neu Busach, and by Albeis near Stralsund in 1834.

In Württemberg, between the years 1825 and 1837, numerous outbreaks were reported. The great number in 1829 corresponds with the publication of a description of cow-pox:—In 1825, one; in 1827, five; in 1828, three; in 1829, 38; in 1830, 31; in 1831, 31; in 1832, 18; in 1833, 14; in 1834, 18; in 1835, 19; in 1836, 25; and in 1837, 18.

In Holland, according to Neumann, cow-pox was found in 1805, in 1811, and 1824. In Denmark it was found by Niergaard at Funen in 1801. In Russia, in 1838, an epizootic occurred among the cows in a village in the neighbourhood of St. Petersburg.

In North America it was found by Dr. Buett, of Massachusetts, and by Drs. Norton and Trowbridge of Connecticut in 1801. In South America it was found in the Valley of Ablixco, in the neighbourhood of Valladolid de Mechoacan, and in the district of Calabozo, in the province of Caracas, and by Humboldt in Peru, and was known according to Pepping, among the cows in Chili. It is hardly necessary, after reciting these instances, to insist that cow-pox is far from being a rare disease, as many have supposed who are unacquainted with the literature of the subject, and unfamiliar with the appearances of the natural disease in the cow.

11,299. What are the recent outbreaks of which you have had personal experience?—The Wiltshire outbreak; there have been two or three Wiltshire outbreaks.

11,300. Is that the only one you have personally examined?—No, I have also personally investigated one or two other outbreaks which are included in the list in the Report on Eruptive Diseases in the teats and udders of cows. You will find that on page 77. It was a Report of the Agriculture Department of the Privy Council.

11,301. Were the characteristics the same in all those cases?—The accounts in the continental cases vary a great deal, but I think I will touch upon that in my next statement.

11,302. Is that all you wish to say in reference to outbreaks of cow-pox?—Yes.

11,303. You pass now to the subject of the pathology of natural cow-pox?—The description of cow-pox given by Jenner, in 1798, was the first published account. The disease in the cow was described as consisting of irregular pustules on the teats, of a palish blue colour, surrounded by an erysipelatous inflammation, and characterised by a tendency to degenerate into phagedenic ulcers. Then we have an account of the outbreak which was reported to Dr. Woodville in 1799. Dr. Bradley gave a coloured plate of the disease on the arm and fingers of a milker. I have had a copy made of it, that was the hand of Sarah Rice. With regard to that outbreak Dr. Bradley gives the following description which I take from the "Medical and Physical Journal" of March 1799: "In order to continue the history of the subject down to the present time we announce to our readers that, about the latter end of December last the cow-pox broke out among the herds of several milk farms in the environs of London. The disease spread rapidly so that at one farm in the second and third weeks of

"the following month, namely January, more than 200 out of 850 cows were there affected or had lately passed through the disorder. At another farm between 60 and 70 cows out of about 350 had the disease. This epizootic contagion disappeared rapidly after the time last-mentioned; for by the 4th of February not a single cow could be found in such a state as to afford matter for inoculation. The cow-pox in this instance appears to have been very mild for no loss was experienced by the farmers from the deficiency of milk as usually happens. At one of these farms two milkers only contracted the disease and were affected very slightly; at the other farm only one of the 200 milkers were infected. A number of philosophical and medical gentlemen, the President of the Royal Society and the Board of Agriculture, &c., visited one of the above farms to observe the phenomena of the cow-pox both among the cows and the milkers. A sufficient quantity of matter was collected, and a number of persons have been inoculated of the age of two weeks and upwards. They all took the disease and passed through it without being so ill as to be confined a single day, and indeed very few of the patients made any complaints."

These early descriptions were supplemented by an account of cow-pox by Mr. Lawrence, the author of "A Philosophical and Practical Treatise on Horses, and on the Moral Duties of Man towards the Brute Creation." Lawrence's article on cow-pox not only affords evidence that this disease was known to those who had the care of cattle before Jenner's paper was published, but it shows that it had also been made the subject of practical observation and study by veterinarians; Lawrence concluded by saying, "What ever may be the fate of cow-pox inoculation it has and will give further occasion to a pretty large and open discussion, which is always beneficial as having a tendency to produce discovery and promote improvement, and when the public ardour for the present topic shall have become a little cool and satisfied, I hope it will be turned by enlightened men towards another, perhaps of nearly as great consequence, namely, the prevention of the original malady in the animals themselves. Those who had witnessed it, and only reflected upon the excessive filth and nastiness which must unavoidably mix with the milk in an infected dairy of cows, and the corrupt and insalubrious state of their produce in consequence, will surely join me in that sentiment." Lawrence was almost a century before his time. Cow-pox was not again brought forward in this light until 1887-88, when I reported the contamination in the milk at the Wiltshire Farms, and advocated the advisability of placing this disease under the Contagious Diseases (Animals) Act.

Then we come to the researches of Dr. Robert Ceely. A number of investigators, as I have already said, met with outbreaks of cow-pox, but beyond the fact of raising stocks of vaccine lymph they did not make any observations upon the pathology of the disease; but in 1838-40 Ceely published his classical researches. In Ceely's experience in the Vale of Aylesbury, outbreaks occurred at irregular intervals, most commonly appearing about the beginning or end of the spring, rarely during the height of summer; there were outbreaks at all periods from August to May and the beginning of June; cases being met with in autumn and the middle of winter, after a dry summer. The disease was occasionally epizootic, or occurring at times at several farms at no great distance from each other, but was more commonly sporadic or nearly solitary. It was to be seen sometimes at several contiguous farms, at other times at one or two farms. Many years might elapse before it recurred at a given farm, although all the animals might have been changed in the meantime. Cow-pox had broken out twice in five years in a particular vicinity at two contiguous farms, while at an adjoining dairy, in all respects similar in local and other circumstances, it had not been known to exist for 40 years. It was sometimes introduced into a dairy by recently purchased cows. Twice it had been known to be so introduced by milch heifers. It was considered that the disease was peculiar to the milch cow; it came primarily while the animal was in milk, and it was casually propagated to others by the hands of the milkers. Stirks, dry heifers, dry cows, and milch cows milked by other hands, grazing in the same pastures, feeding in the same sheds, and at contiguous stalls, remained exempt from the disease. For many years past the spontaneous origin of cow-pox had not been



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doubted in the Vale of Aylesbury. In all the cases that Ceely had noticed he could never discover the probability of any other origin. He says there was much difficulty in determining, at all times with precision, whether this disease arose primarily in one or more individuals in the same dairy. Most commonly, however, it appeared to be solitary. The milkers believed they were able to point out the infecting individual. In two instances there could be very little doubt upon this point. In August 1838 three cows were affected with the disease. The first was attacked two months after calving and seven weeks after weaning. This animal was considered in good health, but it looked out of condition. Heat and tenderness of the teats and udder were the first-noticed signs. The other two were affected in about 10 days. In December 1838, in a large dairy, a milch cow slipped her calf, had heat and induration of the udder and teats, with cow-pox eruption, and subsequently leucorrhœa, and greatly impaired health; the whole dairy, consisting of 40 cows, became subsequently affected, and also some of the milkers. In another dairy, at the same time, it first appeared in a heifer soon after weaning, and in about 10 or 12 days extended to five other heifers, and one cow milked in the same shed affecting the milkers; and in another dairy 30 cows were severely affected, and also one of the milkers. It appeared to originate in a cow two months after calving. The only symptoms noticed were that the udder and teats were tumid, tender, and hot just before the disease appeared. Then with regard to the condition of the animals casually affected, Ceely says that in some animals it was less severe than in others, depending on the state and condition of the skin of the parts affected, and the constitution and habit of the animal. It was sometimes observed to diminish the secretion of milk, and in most cases, it commonly did actually affect the amount artificially obtained; with this exception, and the temporary trouble and accidents to the milk and the milkers, little else was observed; the animal continued to feed and graze apparently as well as before. The topical effects varied very much in different individuals; the mildness or severity being greatly influenced by temperament and condition of the animal, and especially by the state of the teats and udder, and the texture and vascularity of the skin of the parts affected. Where the udder was short, compact, and hairy, and the skin of the teats thick, smooth, tense, and entire, or scarcely at all chapped, cracked, or fissured, the animal often escaped with a mild affection, sometimes with only a single vesicle. But where the udder was voluminous, flabby, pendulous, and naked, and the teats long and loose, and the skin corrugated, thin, fissured, rough, and unequal, then the animal scarcely ever escaped a copious eruption. Hence in general heifers suffered least, and cows most, from the milker's manipulations. Next as to the progress of the disease. Cow-pox once arising or introduced, and the necessary precautions not being adopted in time, appeared in 10 or 12 days on many more cows in succession, so that among 25 cows, perhaps, by the third week nearly all would be affected; but five or six weeks or more were required before the teats were perfectly free from the disease. As to the propagation by the hand of the milker, Ceely was able to confirm the way in which the disease was said to spread. In December 1838, on a large dairy farm, where there were three milking sheds, cow-pox broke out in the home or lower shed. The cows in this shed being troublesome, the milker from the upper shed, after milking his own cows, came to assist in this for several days, morning and evening, when in about a week, some of his own cows began to exhibit the disease. It appears that having chapped hands, he neglected washing them for three or four days at a time, and thus conveyed the disease from one shed to another. During the progress of the disease through this shed, one of the affected cows which had been attacked by the others was removed to the middle shed, where all the animals were perfectly well. This cow, being in an advanced stage of the disease, and of course difficult to milk and dangerous to the milk pail, was milked first in order by the juvenile milker for three or four days only, when becoming unmanageable by him, its former milker was called in to attend exclusively to it. In less than a week all the animals of this shed showed symptoms of the disease, though in a much milder degree than it had appeared in the other sheds, fewer manipulations having been performed by an infected hand. Then, in speaking of the topical symptoms of the natural disease, Ceely was almost always, in the early stage, compelled to depend on the observations and state-

ments of the milkers as to these. They stated that for three or four days, without any apparent indisposition, they noticed heat and tenderness of the teats and udder, followed by irregularity and pimply hardness of these parts, especially about the bases of the teats and adjoining the vicinity of the udder. These pimples on skins not very dark are of a red colour and generally as large as a vetch or a pea, and quite hard, though in three or four days many of these increase to the size of a horse bean. Milking is generally very painful to the animal, the tumours rapidly increase in size, vesicate, and are soon broken by the hands of the milker. Milking now becomes a troublesome and, occasionally, a dangerous process. Ceely adds, "It is very seldom that any person competent to judge of the nature of the ailment has access to the animal before the appearance of the disease on others of the herd, when the cow first affected presents on the teats acuminated, oval, or globular vesications, some entire, others broken, not unfrequently two or three interfluent. Those broken, have evidently a central depression with marginal induration; those entire, being punctured, effuse a more or less viscid amber-coloured fluid, collapse, and at once indicate the same kind of central and marginal character. They appear of various sizes, from that of a pin's head, evidently of later date, either acuminated or depressed, to that of an almond, or a filbert, or even larger; dark brown or black, solid, uniform crusts, especially on the udder, near the base of the teats, are visible at the same time; some, much larger, are observed on the teats; these, however, are less regular in form, and less perfect; some are nearly detached, others quite removed, exhibiting a raw surface, with a slight central slough. The forms of the crusts on the udder are either circular or ovoid, slightly acuminated or depressed, and the crusts seem imbedded in or surrounded with more or less indurated integument. On the teats the crusts are circular, oval, oblong, or irregular; some flatter, others elevated and unguiform, several irregular, some thin and more translucent, being obviously secondary. The appearance of the disease in different stages, or at least the formation of a few vesicles at different periods, seems very evident. The swollen, raw, and encrusted teats seem to produce uneasiness to the animal only while subjected to the tractions of the milkers, which it would appear are often nearly as effective as usual." Referring again to the character of the vesicle, Ceely says that those fortunate enough to have an opportunity of watching the disease in its progress may observe that when closely examined they present the following characters: "In animals with dark skins, at this period, the finger detects the intumescent indurations often better than the eye, but when closely examined, the tumours present at their margins and towards their centre a glistening metallic lustre or leaden hue; but this is not always the case, for occasionally they exhibit a yellowish or yellowish-white appearance."

11,304. (Chairman.) I do not quite understand your purpose in quoting these observations of Ceely?—To give a concise account of the pathology of the disease.

11,305. Do you give that evidence as adopting Ceely's descriptions?—Yes.

11,306. Because your observations have confirmed those descriptions?—Yes, my observations have confirmed those descriptions. Then in some cases the disease is more severe. Describing the crusts in detail, Ceely says, "Large black solid crusts, often more than an inch or two in length, are to be seen in different parts of these organs; some firmly adherent to a hard and elevated base; others partially detached from a raw, red, and bleeding surface; many denuded, florid red, ulcerated surfaces, with small central sloughs, secreting pus and exuding blood; the teats excessively tender, hot, and swollen. . . . In some animals, under some circumstances, this state continues little altered till the third or fourth week, rendering the process of milking painful to the animal, and difficult and dangerous to the milker. In many, however, little uneasiness seems to exist; the parts gradually heal; the crusts, though often partially or entirely removed and renewed, ultimately separate, leaving apparently but few deep, irregular cicatrices, some communicating with the tubuli lactiferi, the greater part being regular, smoothly depressed, circular, or oval." With regard to papulæ, he says that the milkers seldom notice the first period of papulation. "Nor is this in



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"the least to be wondered at: it is, in truth, very difficult for an experienced observer at all times to escape error in this latter particular, and oversights will occur to the most vigilant from various causes, especially from peculiarity of colour, vascularity, and texture of skin, as well as temperament of the individual." With regard to any central depression of the vesicles, Ceely found that "in three or four days from their first appearance, the papulæ acquire their vesicular character, and have more or less of central depression, continuing gradually to increase; in three or four days more they arrive at their fullest degree of development, and sometimes are surrounded with an areola, and always embedded in a circumscribed induration of the adjacent skin and subjacent cellular tissue." If we carefully analyse this description of natural cow-pox, we find that we have a most faithful account of the disease as it actually occurred under Ceely's eyes. But, here and there, we see an attempt to harmonise these observations with the classical description of the inoculated disease. In ordinary vaccination we recognise the stages of the papulæ, the vesicle with its central depression, the scab, and the scar. And Ceely describes the natural cow-pox under each of these headings. But when describing the vesicles he practically admits that the classical character of umbilication is absent, for he says that those broken had evidently a central depression, and on another occasion, that the vesicles three or four days after the appearance of papulæ have more or less of a central depression. There can be little doubt that in the use of these ambiguous expressions Ceely was influenced by constantly having in his mind the effects of ordinary vaccination. And this explains the appearances represented on the first picture of cow-pox on the cow's teats which illustrates his classical memoir. The second plate is a faithful picture of the disease on the teats as it is ordinarily met with. But the first plate is a composite picture, consisting of the disease as ordinarily observed in the cow, to which is superadded a number of depressed vesicles as they occur in inoculated cow-pox. It is, however, an improvement on a plate published by Sacco, which may be regarded as a pathological diagram. The latter is an elaborate drawing, representing the udder and teats of a cow, with an eruption purporting to be the natural cow-pox. Jenner had described a bluish tint in the vesicles in natural cow-pox, and Sacco deliberately represents the natural disease by a drawing in which he depicts clusters of vesicles of inoculated cow-pox, coloured blue with a silvery lustre. Ceely appears to have outlined his drawing from Sacco's and to have represented crusts and scabs on the teats as he really saw them, but unfortunately the representation of the vesicular stage does not even correspond with his written description. I say "unfortunately," for while Sacco's plate was accepted as a genuine representation for the first half of this century, Ceely's plate has been accepted (particularly in this country) for the latter half.

Hering has given a coloured plate of the natural cow-pox, and it will be noticed that it is totally different from either Sacco's or Ceely's drawing. On the teats are a number of oval and circular bullous vesicles and crusts. More recently Layet has pointed out the same characters in the cow-pox discovered near Bordeaux in 1883 and 1884. The classical characters of the inoculated disease were wanting, particularly the central depression. In Wiltshire I could only distinguish on the cow's teats globular and broken vesicles and thick prominent crusts and ulcers, appearances which had very little in common with the ordinary results of vaccination.

11,307. Do you suggest that there was no central depression usually?—Quite so; I suggest that Ceely's description is extremely accurate, although it does not quite correspond with his plate; that his description is more accurate than his coloured drawing; still they are excellent as drawings; and the second plate is, as I have already said, a faithful picture of the disease on the teats as it is ordinarily met with.

11,308. Do you suggest that these drawings were not copied from what he saw?—I have gone into that point very carefully. I think that his second drawing is a most useful and admirable drawing, but I think his first drawing must be regarded rather as a diagram than as an accurate picture of an individual case, because when we refer to this drawing we find that he refers you for a description of it to two pages upon which he is giving a general account of the disease, and, as I shall point out, more recent investigations in France and Germany (we have fortunately plates given) show that

Ceely's written description is perfectly correct, but his picture is, I think, an ideal diagram.

11,309. In what respects does the description differ from what is exhibited by the drawing?—In the drawing we have an appearance of depressed vesicles very much as one would see in inoculated cow-pox, whereas the description says the vesicles are "acuminated," "ovoid, or globular." Those who have more recently investigated cow-pox have given drawings which more accurately bear out Ceely's description than his own drawings do.

11,310. In what respect are they different; are they not represented as acuminated and ovoid?—He represents the vesicles as depressed, whereas he says in his description they are acuminated and ovoid; he simply says they are depressed "when broken" in natural cow-pox.

11,311. (*Sir William Savory.*) Do not the vesicles vary at different stages of their development?—Yes.

11,312. The vesicle will not be in the same state every day; might it not be fairly described as "acuminated" at the early stage, and does it not subsequently become umbilicated or depressed?—Yes, in inoculated cow-pox, no doubt.

11,313. One word or two words will not describe the whole character of the vesicles through all the stages of their progress?—My point is that recent researches show that the fully-developed vesicle of natural cow-pox is not umbilicated; and this is fully borne out by the fully-developed vesicles of horse-pox, which are not umbilicated. I would point to this drawing I have here of Hering's, which he says is drawn from nature. Here you have the fully-developed vesicle not umbilicated just as Ceely described. The most recent of all is the plate by Dr. Layet of the Bordeaux cow-pox with similar appearances.

11,314. (*Chairman.*) Do you suggest that the central depression arises from the breaking of the vesicle, and that if the vesicle had not been broken there would have been no depression?—Yes, in natural cow-pox; that is what Ceely described undoubtedly.

11,315. Before it broke there was no depression?—That is so.

11,316. (*Professor Michael Foster.*) What does he mean then by this statement, that "they exhibit an ash-coloured or bluish rather acuminated apex, which gradually becomes relatively flatter as the base enlarges and elevates, when the central depression is more obvious, and exhibits a yellowish tinge"?—No doubt he made that statement, and, as I read to you, he also said, "In three or four days from their first appearance, the papulæ acquire their vesicular character, and have more or less of central depression"; but this is not invariably the case; it is, I believe, when you have inoculated cow-pox vesicles that you have the true central depression.

11,317. (*Sir William Savory.*) Do you believe that the central depression is invariably due to injury?—I think it invariably occurs in inoculated vesicles, not in natural vesicles.

11,318. (*Chairman.*) But in these cases in which some of the vesicles were broken and exhibited the central depression they were all natural, were they not; at all events, they were either all natural or all inoculated?—They were the natural vesicles.

11,319. Then in those he gets a central depression; at all events, in those that are broken?—Yes, but not the classical umbilication.

11,320. Do you suggest that it was the breaking alone which caused the depression?—Yes; in those cases.

11,321. (*Sir William Savory.*) But in any case cannot you have a central depression without breaking?—I doubt it in natural vesicles.

11,322. (*Professor Michael Foster.*) Is Ceely's description which I read to you inaccurate?—I would not say it was inaccurate, because Ceely was a very accurate observer; but his descriptions require to be very carefully analysed.

11,323. (*Sir William Savory.*) What is your ground for stating that where Ceely described the vesicle as umbilicated it must of necessity have been injured?—I do not say that it must "of necessity" have been injured, but his description clearly bears out that view. He says the vesicles are globular, but that "those broken" have a depression.

11,324. In what respect does his description bear out your statement that "it must have been injured"?—



Because when he is giving a most complete account of the vesicles in natural cow-pox he says the vesicles are "acuminated, oval, or globular," and that "those broken, have evidently a central depression," but he does not say that the globular condition is followed by umbilication.

11,325. But in other places he speaks of "umbilication" without breaking, does he not?—He says "more or less."

11,326. A very wise mode of expression generally; meaning, does he not, that the more or less depression comes without of necessity injury?—Possibly, but I want to draw particular attention to this description of Ceely's, and to show that we must not regard an eruption which consists of globular vesicles upon the teats as not cow-pox.

11,327. (*Chairman.*) In the cases you examined was there no central depression?—In respect to the cases I examined I was not sufficiently fortunate to see the eruption in its early stage except in one case, the only vesicles I saw were globular vesicles, and broken vesicles which then exhibited a central depression.

11,328. So that you have no personal experience which enables you to say that in natural cow-pox central depression is not exhibited more or less in the unbroken vesicle?—Not sufficient.

11,329. You draw your conclusion from others?—Yes; from Hering, and from Layet, who has given a plate of the cow-pox, and who lays great stress upon this, and therefore we are not to eliminate the diagnosis of cow-pox when the eruption assumes the bullous form.

11,330. (*Dr. Bristowe.*) Is your only ground for saying that the drawing is not a true representation, that the drawing represents the vesicles as umbilicated?—The drawing is not in accord with Ceely's written description of what he actually saw or with what others have seen and depicted since.

11,331. Still that is the only ground that you put forward?—Yes.

11,332. (*Dr. Collins.*) You were in time to see the globular vesicles in Wiltshire, were you not?—Yes, but only in one case and with very great difficulty. Ceely's description bears me out that you hardly ever get in time to see the vesicles, unless you happen to be living upon the farm. You must consider yourself very fortunate indeed if you see the eruption in the vesicular stage.

11,333. (*Sir William Savory.*) They are so liable to be injured?—Yes.

11,334. (*Chairman.*) At page 388 of the second volume of your book I see Ceely says, "The appearance of the natural and casual disease, not unfrequently in different stages, at the same time, in the same subject, is too obvious to be overlooked by even superficial observers. Papular or tubercular elevations—papule, more or less advanced to the vesicular form—vesicles, more or less dimpled or depressed—vesicles more or less acuminated, conoidal, or semi-globular—vesicles, more or less dessicated—varying in size from a mere point to 8 or 10 lines or more in diameter;" does not he there seem to give the vesicles more or less depressed as one of the characteristics to be observed at some stage?—Yes, he says "more or less."

11,335. And, "vesicles more or less acuminate, conoidal, or semi-globular," as apparently what you would expect to find at some other stage?—Yes; but I think you would agree with me that that description is a little ambiguous. Then, again, we now have drawings of the vesicles of natural cow-pox from which vaccine stocks have been raised showing the teat studded with globular vesicles, therefore we must not eliminate similar cases as not being cow-pox, that is the inference I want the Commission to draw.

11,336. That the globular will never become the depressed?—Yes; almost as soon as they are globular they are broken; in natural cow-pox the vesicle does not get fair play almost as soon as it is globular—the next morning probably—it would be broken by the hand of the milker.

11,337. As I understand, your object is to establish that there may be natural cow-pox without the exhibition of any central depression of the vesicle?—Yes, quite so, without the so-called classical character of the inoculated vesicle.

11,338. (*Sir William Savory.*) Nobody would dispute that, I suppose?—That was a reason why at Hendon the diagnosis of cow-pox was excluded.

11,339. That was one of the reasons?—Yes; that was one of the fallacies.

11,340. (*Chairman.*) You are desirous of drawing a distinction between the appearances of natural cow-pox and the appearances of inoculated cow-pox?—I was anxious also to explain what I meant by saying that Ceely's picture seems to be suggested by the drawing of Sacco.

11,341. May I ask if you have seen Ceely's original drawings?—Yes; I am acquainted with them, and I may say here that with regard to the other diseases he depicts, there is the same tendency to be rather diagrammatic. I am not under-rating them for a moment, because I think them invaluable, but there is the same tendency running through them all.

11,342. (*Dr. Bristowe.*) Were the drawings made by himself, do you know?—Yes, I think they were.

11,343. He probably was not a great artist?—They are uncommonly well done, I must say; if they are still where I saw them they are in a drawer of one of the cases in the museum of the College of Surgeons, therefore you could easily refer to them.

11,344. (*Dr. Collins.*) Can you tell me whether the plate you have referred to as a somewhat ideal diagram of natural cow-pox exists amongst the collection of Ceely's drawings at the College of Surgeons museum?—I cannot recollect; it is nearly three years ago since Sir James Paget drew my attention to them.

11,345. (*Chairman.*) What inference do you wish to be drawn from the comparison between Ceely's drawings and Sacco's?—To show that, although there is a similarity in the drawings, there is a considerable difference in the character of the eruption. Sacco has, in accordance with Jenner's description, made the vesicles blue, whereas Ceely has drawn them of a whitish colour; but I may say that although Sacco too represented the vesicles with a depression, and has given everyone the idea that that is a characteristic feature of cow-pox, yet it is extremely doubtful whether he really drew that from a natural case of cow-pox, because it is quite obvious that the vesicles he represents are inoculated cases of cow-pox. The long slipper-shaped vesicles are the result of linear inoculations.

11,346. (*Chairman.*) They are marked A. and B.; does that refer to them as inoculated?—Yes.

11,347. That would suggest that the others were natural?—Yes.

11,348. (*Sir William Savory.*) But he describes the natural very often as "irregular," does he not?—Yes.

11,349. (*Chairman.*) In inoculated cow-pox is that depression always seen?—At the inoculated spot, yes. I have here Layet's drawing of the natural cow-pox in which he gives the complete evolution of the disease. He very strongly maintains that the vesicles of so-called spontaneous cow-pox are without any depression. The point I want to impress is that if you met with a disease consisting of the bullous vesicles which Layet represents, it must not be eliminated as not cow-pox.

11,350. What is your next observation with regard to the pathology of natural cow-pox?—The next point is with regard to casual cow-pox upon the hands of milkers. I may illustrate this by some of Jenner's cases. For instance, Joseph Merret had several sores on his hands, swelling and stiffness in each axilla, and much indisposition for several days. Mrs. H. had sores upon her hands which were communicated to her nose, which became inflamed and very much swollen. Sarah Wynne had cow-pox in such a violent degree that she was confined to her bed, and unable to do any work for 10 days. William Rodway was so affected by the severity of the disease that he was confined to his bed. William Smith had several ulcerated sores on his hands, and the usual constitutional symptoms, and was affected equally severely a second and a third time. William Stinchcomb had his hand very severely affected with several corroding ulcers and a considerable tumour in the axilla. Sarah Nelmes had a large pustulous sore on the hand, and the usual symptoms. A girl had an ulceration on the lip from frequently holding her finger to her mouth to cool the raging of a cow-pox sore by blowing upon it. A young woman had cow-pox to a great extent, several sores which matured having appeared on the hands and wrists. A young woman had several large suppurations from cow-pox on the hands. I would then point out that Pearson in his investigations encountered and was informed of similar experiences; he says that Thomas Edinburgh was so lame from the eruption of cow-pox

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on the palm of the hands as to necessitate his being for some time in hospital. For three days he had suffered from pain in the arm-pits, which were swollen and sore to the touch. He described the disease as uncommonly painful, and of long continuance. A servant at a farm informed Pearson that in Wiltshire and Gloucestershire the milkers were sometimes so ill as to lie in bed for several days. Mr. Francis said that cow-pox was very apt to produce painful sores on the hands of milkers. A servant of Mr. Francis said that cow-pox affected the hands and arms of the milkers with painful sores as large as a sixpence. Mr. Dolling described the disease as "a swelling under the arm, chilly fits, &c., not different from the breeding of the small-pox. After the usual time of sickening, namely, two or three days, there is a large ulcer, not unlike a carbuncle, which discharges matter." Dr. Pulteney described the disease as causing "a soreness and swelling of the axillary glands, as under inoculation for the small-pox, then chilliness and rigors and fevers, as in the small-pox. Two or three days afterwards abscesses, not unlike carbuncles, appear generally on the hands and arms, which ulcerate and discharge much matter." Mr. Bird wrote a short account: "It appears with red spots on the hands, which enlarge, become roundish, and suppurate, tumours take place in the armpit, the pulse grows quick, the head aches, pains are felt in the back and limbs, with sometimes vomiting and delirium. Annie Francis had pustules on her hands from milking cows. These pustules soon became scabs, which, falling off, discovered ulcerating and very painful sores, which were long in healing. Some milk from one of the diseased cows having spurted on the cheek of her sister, and on the breast of her mistress, produced on these parts of both persons pustules and sores similar to her own on her hands." I will now proceed to point out that in more recent times these descriptions have been confirmed. In 1836 cow-pox was discovered at Passy, near Paris. A black cow, in very poor condition, had cow-pox six weeks after calving. Bousquet had no opportunity of seeing the eruption in the early stage, but on examination he found reddish-brown crusts on the teats, which later gave place to puckered scars. The milkwoman Fleury, who had had small-pox, nevertheless contracted the disease from the cow. She had several vesico-pustules on the right hand and on her lips. A vesico-pustule, when opened with a lancet, discharged like an abscess. In a letter to Mr. Badcock, dated April 3rd 1845, Ceely referred to another new stock of lymph raised from a milker's hand. He added: "In the enclosed lymph I see nothing unusually severe except on very thin skins, although the milker's hand exhibits now rough ulcers, one on the hand deep enough to encase a bean." After Ceely's cases in 1840-41 no cases of casual cow-pox on the hands of milkers were recognised as such and accorded in this country for nearly 50 years. In the outbreak in December 1887 in Wiltshire, the disease was communicated to nearly all the milkers. I need not refer to them in detail, they were similar to those which have already been given.

Then my next point, having described the natural disease on the hands of the milkers, is to show that in inoculated cow-pox in the early removes the severe symptoms remain. For instance, take Jenner's cases, for example, James Phipps was inoculated from the cow. The incisions assumed at their edges rather a darker hue than in variolous inoculation, and the efflorescence around them took on more of an erysipelatous look. They terminated in scabs and subsequent eschars. Susan Phipps was inoculated from the cow by inserting matter into a superficial scratch on December 2nd. "The child's arm now showed a disposition to scab, and remained nearly stationary for two or three days, when it began to run into an ulcerous state; and then commenced a febrile indisposition, accompanied with an increase of axillary tumour. The ulcer continued spreading near a week, during which time the child continued ill, when it increased to a size nearly as large as a shilling. It began now to discharge pus; granulations sprung up, and it healed." Jenner's lymph was employed by Mr. Cline with similar results. "The child sickened on the seventh day, and the fever, which was moderate, subsided on the eleventh. . . . The ulcer was not large enough to contain a pea." Similar experiences have since been encountered in the early removes of fresh stocks of virulent lymph. Bousquet, in France, in his first trials with a new lymph in 1836, made three punctures, but he had soon to aban-

don this practice, because the intensity of the inflammation was sometimes so great that it spread over the entire arm as far as the glands of the axilla. In one case the vesicles were enormous, and the inflammation so violent that baths, poultices, fomentations, and antiphlogistic diet scarcely sufficed to reduce it. The crusts, when they fell off, left ulcerations which were very slow to undergo cicatrisation. In some cases the vesicles which resulted hollowed out the skin so deeply that they left regular holes. In the following year Estlin, in England, started a stock of fresh vaccine virus from the cow, and found on inoculating children that the new lymph was extremely active. In 52 cases the disease was regular; in one severe erysipelas followed; in four there were erythematous eruptions of a violent character; two had highly inflamed, ulcerated arms; one exhibited no effect after twice vaccinating; in eight the result was unknown, but was supposed to have been favourable; making in all 68 cases. What I am establishing is that when the disease is casually transmitted from the cow to the hand of the milker we have severe symptoms, and that also in the early removes of intentional inoculation we get similarly severe symptoms.

11,351. What do you mean by the "early removes"?—That is to say, that in the first series of inoculations and in the second series of inoculations from the cow you get these severe symptoms, such as ulceration and highly inflamed arms; but when the arm-to-arm or calf-to-calf inoculations have been carried on for some time these severe symptoms gradually disappear; the lymph in fact, to use a modern expression, becomes attenuated.

11,352. You do not desire to cast any doubt upon the fact of its being the same disease that is communicated; only that it is communicated in a milder form?—Yes; it is communicated in a milder form by cultivated or attenuated lymph. When cow-pox lymph has been mitigated by successive transmission through the human subject, or by cultivation on the belly of the calf, with careful selection of vesicles, it will produce effects which are as follows: About the end of the second day after insertion, or early on the third day, a slight papular elevation is noticeable. By the fifth or sixth day it has become a distinct vesicle, of a bluish white colour, with raised margin and central cup-like depression. By the eighth day the vesicle is perfect. It is circular, pearl-coloured, distended with clear lymph, and the central depression is well marked. On the same day, or a little earlier, the areola begins to appear, and gradually extends to a diameter of from one to three inches, accompanied with induration and tumefaction of the subjacent connective tissue. After the tenth day the areola begins to fade, and the vesicle at the same time begins to dry in the centre; the lymph becomes opaque and gradually concretes, and by the fourteenth or fifteenth day a hard mahogany-coloured scab is formed, which contracts, dries, blackens, and falls off between the twentieth and twenty-fifth days.

11,353. Is there any distinction observed between the disease communicated directly by contagion from the cow to the milker according as it is contracted by contact at an earlier or later stage of the disease in the cow?—I have no evidence of that.

11,354. That distinction you would expect to find, would you not?—I should expect to find it.

11,355. (*Professor Michael Foster.*) Are there not so many vesicles in so many different stages upon the same cow, you would very rarely find cases in which the disease would be communicated to a milker from the first initial pustule at its earliest stage? You have not cases of that kind on record, have you?—No, I think not.

11,356. Later on you have vesicles in different stages so that you cannot say whether it is a late infection or not?—It is difficult to say.

11,357. (*Chairman.*) But what I wanted to know was this. Without being able to trace the fact that the disease was contracted in one case at the earlier stage of the disease in the cow, whilst in another it was contracted at the later stage, whether there was observed in point of fact considerable diversity in the severity of the symptoms exhibited by the persons who contracted the disease in that way?—I am not aware that that distinction has been drawn, but possibly that might account for differences in the symptoms exhibited.

11,358. (*Dr. Collins.*) The age of the individual vesicle would bear no necessary relationship to the stage of the disease, would it?—I think it would; the early stage



of the vesicle would correspond with the early stage of the disease.

11,359. (*Chairman.*) I should have thought there must have been a time at which whatever vesicle there was, was in the early stage, and unless it is clear that such a vesicle could not produce contagion, contagion would be produced by the vesicle or vesicles in the early stage?—Quite so. I think it is a very important point; that may account for the varying severity of the disease in the hands of the milkers, but I am not aware that anybody has discriminated in that way until your Lordship pointed it out. I might put it in this way, if you had only one vesicle on the teat to deal with, the early stage of the vesicle would correspond with the early stage of the disease.

11,360. (*Dr. Collins.*) I gathered that you might have vesicles at very different stages of development on the same udder or teat?—Quite so; those would probably be vesicles of auto-inoculation.

11,361. (*Chairman.*) Does that conclude what you have to say with reference to casual inoculation?—Yes.

11,362. Your next point relates to intentional inoculation?—I have included that point in my previous statement.

11,363. (*Dr. Bristowe.*) Do you look upon vaccinia as a specific disease?—In the cow, yes.

11,364. What do you regard as its origin?—I regard it as a disease *sui generis* in the cow.

11,365. Do you mean originating *de novo* or caught from some pre-existing source?—I think it is impossible to give an opinion upon that point.

11,366. Do you think that specific diseases do begin *de novo* constantly?—Not constantly.

11,367. Frequently?—I do not think it is a question which can be answered in a few words; I think it is a very difficult question.

11,368. How many words do you want to answer it in?—Take small-pox, I do not believe that disease ever originates *de novo* in this country.

11,369. Do you believe cow-pox does?—I think it might, judging from Ceely's observations.

11,370. But you have no proof that it does?—No, I have no evidence of it beyond that.

11,371. The presumption, then, is rather the other way, if one has to go to analogous diseases with which we are acquainted?—It is also possible that it might originally be derived from horse-pox.

11,372. But you have no ground for your belief that it originates *de novo* in this country. Arguing from similar diseases, we have no sufficient ground for believing that it does originate *de novo*?—That is not my belief; I said "it might."

11,373. Then I want to know how it is that cow-pox finds its way into a herd of cows or into a dairy, do you suppose that the disease is infectious in the ordinary way through the atmosphere?—Certainly not.

11,374. But that it is spread by contagion?—Invariably.

11,375. And it always attacks the udders and teats?—Quite so.

11,376. It does not attack bulls, I think?—Not unless by accidental inoculation.

11,377. But you do not know it?—No.

11,378. It attacks cows and it attacks milkers?—Yes.

11,379. Do you know whether cows give it to the milkers, or the milkers give it to the cows?—In the first instance the cows give it to the milkers unquestionably.

11,380. How do you know that; how does it spread amongst a number of cows in a dairy; does not it spread by means of the milker's hands; if the disease is not spread by the atmosphere, and it is not infectious, and is only spread by direct contagion to the teats of the different animals, how does it get there?—The disease is unknown in man apart from the cow.

11,381. Are you sure it is not unknown in the cow apart from the man?—One must look at it from all points of view; as regards mankind it would seem to stand in very much the same relation as glanders; we know that that is a disease belonging to the horse, though transmissible to man.

11,382. But I am talking of cow-pox. I want to confine your attention to this particular disease. I want to know how it is that the cow-pox spreads from cow to cow in a dairy, affecting only the teats and yet spreading only by inoculation; cows do not rub their teats against one another?—It is a disease which is communicated solely by contact.

11,383. By the hand of the milker?—With the hand of the milker; and, if Ceely was correct, it may commence in a cow after parturition.

11,384. We can imagine all sorts of things, but we have allowed that there is no proof that it arises spontaneously?—We have no proof; but we have no proof on the other hand that it does not so arise.

11,385. But all scientific evidence points the other way; all we know of specific diseases is that they do not arise spontaneously?—They have done so at some time or other.

11,386. The same as human beings have?—There is not necessarily in the present state of our knowledge any comparison between the origin of human beings and the origin of infectious diseases. I was referring to the case of small-pox; I do not think that the question of the possible origin *de novo* can be answered in a few words. Small-pox must have arisen at some time or other, and I think it is quite possible that in the East the same conditions which produced it at one time might arise again, but I do not believe they would arise in this country.

11,387. But you have no proof in support of your view?—I do not hold any view about it beyond admitting possibilities.

11,388. Speaking of cow-pox, I think you said it arises spontaneously?—No, indeed I did not; I only said "it might"; and I said it was a very difficult question to deal with.

11,389. It spreads from cow to cow by the hand of the milker?—Yes.

11,390. It may have been communicated originally from the milker to the cow or from the cow to the milker, for anything you know?—I hold that the disease does not exist in man apart from the cow. I can only argue from a comparison with other diseases, such as glanders, pleuro-pneumonia, swine-fever, hydrophobia. None of these diseases are known in man except such as are communicable from the animal to man.

11,391. Now with reference to the appearance of phagedænic and erysipelatous inflammations arising in cows in connexion with cow-pox; is not there reason to believe that such affections are due to septic organisms which become superadded to the proper virus of cow-pox, and cause results which are no part of the cow-pox?—I would hardly say that, because there seems to be some peculiar association of erysipelatous inflammation with natural cow-pox. In the other eruptive diseases of the cow's teats, which might equally be accompanied by septic organisms, you seldom, if ever, get those same conditions.

11,392. You will recollect that when a cow has had cow-pox the teats, being constantly rubbed by the hands of the milker, are liable to be irritated and to have organisms introduced into the sores; therefore, it would be very unlikely that erysipelatous and other kinds of unhealthy inflammations should not very frequently ensue?—It is possible, but it does not explain the absence of erysipelatous inflammation in other diseases of the teats.

11,393. (*Dr. Collins.*) I think your connexion with the Board of Agriculture has put you in the way of making observations and obtaining a considerable amount of information with reference to the extent to which cow-pox has prevailed in the country?—Yes.

11,394. Have you in any individual instance been able to bring home an example of a case in which an outbreak of human small-pox has been causally connected with an outbreak of cow-pox?—Not one.

11,395. (*Chairman.*) I thought you said you had only experience of the outbreaks in Wiltshire?—I have had experience of other outbreaks, but I was not responsible for the investigation much less for the publication of all of them.

11,396. I would ask where you have had opportunities of observing the appearances presented by cow-pox?—I have to a certain extent had experience of several of these outbreaks, but in answer to your previous ques-

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*Prof. E. M. Crookshank, M.B.* tion I was limiting myself to those cases of which I have published an account myself.

11,397. Perhaps it would be convenient if you gave us the particulars of the other outbreaks in which you have taken part in investigation and seen the phenomena?—There were three outbreaks in Wiltshire, in one case I have published the whole history.

11,398. But as to the others, were you on the spot seeing the animals affected?—In some I was on the spot and had an opportunity of seeing the animals affected, and in some I saw the animals that were brought up to the Royal Veterinary College.

11,399. At all events, you saw animals either on the spot or removed from the outbreak that you referred to?—Yes. Then in the other cases that were reported by the Inspectors of the Board, I made a point of endeavouring to get information if I could with reference to any connexion with small-pox. I may explain that when I first described the outbreak in Wiltshire as cow-pox my views were very much opposed on the ground that there was no milker there suffering from small-pox, and, therefore, in the other cases reported, I made it a great point to find out whether there were any milkers suffering from small-pox.

11,400. (*Dr. Collins.*) Have any extensive investigations been made on behalf of the Board of Agriculture to ascertain the extent to which cow-pox prevails in the country?—Yes, there is a summary on page 77 of the reports from inspectors in different counties.

11,401. Did any of those investigations bring home as the cause of any individual outbreak of cow-pox the inoculation by means of a milker suffering from small-pox?—No.

11,402. In the Wiltshire outbreak, or any of the three outbreaks, were you able to ascertain whether small-pox was present in the neighbourhood?—No.

11,403. I think you paid a visit to M. Layet in Bordeaux with reference to the lymph employed there?—My visit was not with reference to the lymph, but with reference to cow-pox. I was so interested in working out the pathology of cow-pox for the Board of Agriculture that I went over to get all the information that I could from France.

11,404. I think M. Layet favoured the Local Government Board in this country with a stock of lymph to start their establishment?—No; it was not M. Layet, but M. Dubreuilh.

11,405. Could you tell the Commission about the outbreak from which the lymph was obtained?—Yes, I have published an account of it, the first account that has been published in this country, in my second volume; it was called the first Eysines outbreak (*Laforêt*).

11,406. Could you refer the Commission to any periodical?—Yes; it is described in the *Travaux du Conseil d'Hygiène*, at Bordeaux.

11,407. Is it stated that small-pox was very much about there at that time?—I do not think there is any statement to that effect.

11,408. Did you make it your business to endeavour to ascertain whether that was the case or not?—I did, indeed, because, as I have already said, the criticism that was made upon the Wiltshire outbreak depended upon that fact; therefore I went over to Bordeaux, where there was no question about the cow-pox whatever, and I made particular inquiries of M. Layet, and I may say that the opinion there is most distinctly that cow-pox is not derived from small-pox; they hold the same opinion there as I do, that it is a disease *sui generis*, just as glanders is a disease of the horse and syphilis a disease of man.

11,409. (*Sir William Savory.*) Do you attach great importance to these negative results in tracing the cause of these outbreaks?—In the absence of any positive evidence I regard them as most important.

11,410. We have outbreaks of scarlet fever and other things in which the closest investigation fails to trace them to their cause very frequently?—It is sometimes difficult to trace such outbreaks to their cause, but at other times they are traced.

11,411. It is the exception, and a great many utterly fail; even where the disease absolutely occurs are there not disputes as to whether it is the milk or the water, or neither, or both?—Yes, sometimes.

11,412. (*Chairman.*) I observe that on page 595 of the second volume of your book, you state with reference to the Wiltshire disease that you did not learn that there were any horses suffering from horse-pox on neighbouring farms, but that there had been an outbreak of cow-pox that summer on a neighbouring farm, and that the milkers from the neighbouring farms were in the habit of coming to this farm to visit their friends on Sundays, and they sometimes assisted in the milking, and you suggest that it was in that way that it might have been communicated?—Yes.

11,413. I see you state that the only cows that had it were cows that were in milk, that all the dry cows remained free from the disease. Now, unless there is something in the condition of being in milk favourable to the production of the disease, would not that rather point to its introduction from some outside source which had affected the cows in milk and not the dry cows, because they had not been subject to the same contagion?—Yes, undoubtedly; in that outbreak I tried to find out whether there was any one case such as *Ceely* described which might have given rise to the disease, and I could not find it.

11,414. Do not your observations in that case point to the production of the first case by contagion rather than to its having had its origin spontaneously in that cow?—Yes, unquestionably.

11,415. And they show, in addition, that such contagion was possible, even although you could not be certain that you had traced its exact source?—Yes.

11,416. (*Dr. Collins.*) The question is, I apprehend, whether the source of the contagion was small-pox or cow-pox?—Quite so; a previous case of cow-pox or possibly of horse-pox.

11,417. (*Chairman.*) Were you in a position to say that there had been nobody suffering from small-pox upon the neighbouring farms from which the assistant milkers came who helped their friends?—Not upon neighbouring farms. But I made very careful inquiry indeed upon the Wiltshire farms. It is only a supposition of mine, and I think it is a reasonable supposition that the disease was introduced from cow-pox or horse-pox in the neighbourhood.

11,418. If it came from neighbouring farms by means of the visitors who came on Sundays to assist their friends in milking the cows, so that one can suggest the possibility of the cow-pox having been conveyed in that way, still, unless you entirely exclude the existence of small-pox on any of those neighbouring farms, you do not exclude the possibility of its being a small-pox contamination?—That is perfectly correct, but what makes me accept the belief that it is not a disease derived from man is that, taking all those numerous outbreaks of cow-pox which have occurred in Italy, Germany, France, and England, a case has never been met with in which the communication from the man to the cow has been observed. We might say that it is difficult to trace all cases of hydrophobia in man; but so often after the bite of the rabid dog has hydrophobia in man occurred that we assert that hydrophobia in man is in all cases derived from a rabid animal.

11,419. (*Dr. Bristowe.*) Are you going to bring Badcock's experiments before the Commission later on?—Yes.

11,420. (*Dr. Collins.*) Have you read the account of the Alderley outbreak of cow-pox?—I have had only time to glance at it.

11,421. Is there any indication of small-pox being conveyed by the milker to the cow in that case?—No.

11,422. Is it the opinion of those who have mostly tried the experiment that it is an easy thing to inoculate small-pox on the cow?—I would prefer to deal with that matter later on.

11,423. Has it been found an easy matter to inoculate small-pox upon the cow up to the present time?—It has not been found an easy matter to inoculate small-pox upon the cow, for the obvious reason, in my opinion, that it is trying to cultivate a disease upon a foreign soil.

11,424. I suppose the circumstances of those experiments were such as to make the likelihood of the success of inoculation the greatest possible?—Certainly.

11,425. I think I understood you to say that cow-pox in a milker frequently prevents the milker from following his occupation?—Yes.



11,426. Would you or not think it unlikely that a milker suffering from small-pox in such a stage and in such a way as to be likely to infect a cow with small-pox would be able to carry on his occupation?—It is extremely unlikely, but still a very mild attack might not keep a man away from his work as a milker.

11,427. Did not Dr. Klein inoculate a series of something like 30 cows and heifers with selected small-pox lymph by insertion with a lancet and fail in every case to produce any result recognisable as vaccinia?—Yes.

(*Professor Michael Foster.*) Was there no result?

11,428. (*Dr. Collins.*) I think he himself says no definite result. (*To the witness.*) On the whole I gather that you, from your reading and observation, would be disposed to hold the opposite view to that which has been expressed to the Commission, namely, that cow-pox is invariably the result of the inoculation of human small-pox upon the cow?—Unquestionably. The view which is held in France is the view I hold.

11,429. I suppose the origin of species of diseases upon the cow's teats is likely to be involved in as much obscurity as the origin of species generally?—No doubt.

11,430. (*Chairman.*) Is there anything you wish to add to your evidence on this point before passing to another?—I should be glad if I might just sum up what I have been saying. I have not approached this subject from the subject of cow-pox only, but from the study of other diseases of the lower animals, and I have come to the same conclusion as the leading authorities in France that the cow, or possibly the horse, is the natural soil of cow-pox, just as sheep constitute the natural soil of sheep-pox, the horse the natural soil of glanders, and the pig the natural soil of swine fever. Those diseases originate in those animals. Some of those diseases are conveyed to man—for instance, glanders and cow-pox—but we have no evidence whatever to show that those diseases exist in man without contact with those animals.

11,431. Your theory being that the difficulty of inoculating small-pox upon cows results from the fact that it is inoculation upon foreign soil, has any reason occurred to you why there should not be a corresponding difficulty in inoculating cow-pox in man; why are the two cases not strictly corresponding?—It certainly is a law which is not borne out universally, but in those particular cases it appears to be, that is how I should explain the difficulty. Cows have been inoculated with small-pox without success, and have afterwards been inoculated with cow-pox with success, therefore I should be inclined to look upon that as pretty conclusive that when you inoculate the cow with a foreign virus (small-pox) you do not succeed at all, or with great difficulty, whereas when you inoculate the cow with the natural virus (cow-pox) all cases succeed.

11,432. By analogy you would expect that you would naturally fail in inoculating cow-pox upon man, would you not?—If the law of cultivation on foreign soils was a rule without exception, but you may have differences in different diseases.

11,433. At all events, you have no explanation to suggest why cow-pox should be in that way communicable to man whilst small-pox is not communicable to the cow?—Except that it is a point that would have to be very carefully gone into, with reference to a very disputed question indeed of the attenuation of lymph. That is such a wide subject that I should hardly like to go into it before the Commission. There are grounds for believing that the successive humanisation of lymph causes attenuation of that lymph; that would support the theory of its being cultivated on a foreign soil, and when you take the lymph back to the cow, you can regenerate the virus and get it back to its former virulence; but it is a question surrounded with so many points that I shall have to leave it.

11,434. But however attenuated it may become when transported into man and from him to another, there is no difficulty in inoculating a man with vaccine derived at many removes from the cow?—There is no difficulty about it, but I believe there is this difference that you are not so likely to succeed with what is called retro-vaccine as with cow-pox, which has never been humanised.

11,435. (*Dr. Collins.*) There is another point, is there not, where the analogy would fail, and that is that whereas we are informed that human small-pox inoculated upon the cow produces cow-pox; no one, I pre-

sume, contends that cow-pox inoculated upon man ever produces small-pox?—Quite so.

11,436. (*Chairman.*) You next, I believe, propose to deal with the subject of horse-pox?—This also is a subject I have given a great deal of attention to, as it is one which has been a good deal neglected in this country. There is no doubt this disease, horse-pox, is lost sight of under a variety of appellations. I should like, therefore, in some detail to go into this question. My investigation into the history and pathology of cow-pox led to an inquiry into this eruptive disease of the horse, to which, under the name of "grease," attention was first drawn by Jenner. This affection was subsequently distinguished as virulent or constitutional grease, and Mr. Brown, of Musselburgh, suggested the term horse-pox. Jenner's original theory was, that cow-pox was derived from grease, but subsequently he distinguished between cow-pox, a disease peculiar to the cow, and "grease" in the cow, a disease transmitted to the cow from the horse, and the mistake of confounding these two diseases was attributed to farmers and farriers. This distinction that Jenner makes is very often lost sight of, and I should like to quote a passage of his: "From the similarity of symptoms, both constitutional and local, between the cow-pox and the disease received from morbid matter generated by a horse, the common people in this neighbourhood, when infected with this disease, through a strange perversion of terms, frequently called it the cow-pox." Another writer on this subject was Mr. Grose. He said: "I have had many opportunities of conversing with respectable farmers whose cows were affected with the disease, and they unanimously agree in ascribing it to a complaint in the horse's heel, which is called, from its singularity of making the hair erect 'a scratchy heel.' Now, there are many disorders incident to the heel, which do not come under this description; being well fed, or want of exercise, will frequently excite swellings which are by no means connected with a scratchy heel. The spurious cow-pox does not arise from this cause; but is frequently produced when cows, full of milk, are taken to fairs, and their bags permitted to remain full for a length of time; it will also arise from sore teats neglected; and by the friction of the milker's hand, a quantity of extravasated blood is carried on the fingers to the rest of the cows, and produces by absorption a disease similar, but not exactly corresponding with genuine cow-pox." So that he makes the same distinction there as Jenner did later between cow-pox and this disease, grease, transmitted to the cow, which by a strange perversion of terms the people called cow-pox. Jenner's theory of the origin of cow-pox has been discouraged; so also has the view of its being a "spon-taneous" disease in the cow, though Ceely after many years research in the Vale of Aylesbury, could not discover the probability of any other origin. Both opinions have given way to the theory that cow-pox is small-pox transmitted to the cow, an opinion advocated by Baron, and supported by an erroneous interpretation of Ceely's and Badcock's variolation experiments which I will deal with later on. Thus the cow-pox and grease of farmers and farriers no longer attracted attention, while the hypothetical cow small-pox, as it has never been discovered, has been credited with being extinct. The derivation of lymph for the purpose of "vaccination," from a disease of the horse is almost, if not entirely, unknown to medical practitioners in this country, and certainly vaccinogenic "grease," at the present day, is not differentiated by practical veterinarians from the various diseases which it simulates. Like actinomycosis, it has been lost sight of under a variety of appellations. I am aware that Dr. Fleming wrote on the subject of horse-pox in 1875, and again in 1880, and that Dr. Williams believes that he saw a case of horse-pox in 1872, but I have it on authority that horse-pox is not generally recognised in this country, though continental veterinarians describe it as a disease of not infrequent occurrence. As I was unable to get any practical information on the subject of horse-pox in this country, I made it one of my principal objects during my visit to the French veterinary schools to inquire into, and, if possible, practically study this malady. It was, therefore, with great interest that I heard that Professor Peuch, of Toulouse, had not only investigated outbreaks of this disease, but also was in the possession of drawings illustrating its different manifestations. Jenner, as I have said, was the first to draw attention to it in writing, he says: "There is a disease to which the horse, from his state of domestication, is frequently subject. The farriers

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"have termed it the grease. It is an inflammation and swelling in the heel, accompanied at its commencement with small cracks or fissures from which issues matter possessing properties of a very peculiar kind." Jenner gave several instances in which this disease was communicated to man and to cows. He gave the case of a man named Merret who attended to some horses with sore heels, and also milked the cows. The cows were infected and the man had several sores upon his hands. There was the case of William Smith, on another farm, who attended to horses with sore heels and milked the cows also. The cows were infected, and on one of Smith's hands there were several ulcerated sores. Simon Nicholls applied dressings to the sore heels of one of his master's horses, and at the same time milked the cows, and the cows were infected in consequence. A mare, the property of a dairy-farmer, had sore heels and was attended to by the servant-men of the farm, Thomas Virgoe, William Wherret, and William Haynes. They contracted "sores in their hands," followed by inflamed lymphatic glands in the arms and axillæ, shiverings succeeded by heat, lassitude and general pains in the limbs, and the disease was also communicated to the cows. But Jenner's experience of this disease was not limited to cases in which the eruption occurred in the heel. He mentioned a case in which "an extensive inflammation of the erysipelatous kind," appeared without any apparent cause upon the upper part of the thigh of a sucking colt. . . . The inflammation continued several weeks, and at length terminated in the formation of three or four small abscesses." Those who dressed the colt also milked the cows on the farm, and communicated the disease to them. Subsequently Jenner gave a more comprehensive description of this disease: "The skin of the horse is subject to an eruptive disease of a vesicular character, which vesicle contains a limpid fluid, showing itself more commonly in the heels. The legs first become œdematous, and then fissures are observed. The skin contiguous to these fissures, when accurately examined, is seen studded with small vesicles surrounded by an areola. These specimens contain the specific fluid. It is the ill-management of the horse in the stable that occasions the malady to appear more frequently in the heel than in other parts. I have detected it connected with a sore on the neck of the horse, and on the thigh of a colt." The Rev. Mr. Moore, of Chalford Hill, described a case in 1797, and regarded the disease as virulent grease. His horse was attacked with what was supposed to be ordinary "grease." A cow was subsequently infected, and the disease communicated to the servant, who had eruptions on his hands, face, and many parts of the body, the pustules appearing large and not much unlike the small-pox, for which he had been inoculated a year and a half before, and had then a very heavy burden." In 1798, Mr. Fewster, of Thornbury, met with a case of this equine malady, and wrote a very full account to Jenner of its transmission to the human subject. "William Morris, aged 32, servant to Mr. Cox of Almonsbury, in this county, applied to me the 2nd of April, 1798. He told me, that four days before he found a stiffness and swelling in both his hands, which were so painful, it was with difficulty he continued his work; that he had been seized with pain in his head, small of the back, and limbs, and with frequent chilly fits succeeded by fever. On examination I found him still affected with these symptoms, and that there was great prostration of strength. Many parts of his hands on the inside were chapped, and on the middle joint of the thumb of the right hand there was a small phagedænic ulcer, about the size of a large pea, discharging an ichorous fluid. On the middle finger of the same hand there was another ulcer of a similar kind. These sores were of a circular form, and he described their first appearance as being somewhat like blisters arising from a burn. He complained of excessive pain, which extended up his arm into the axilla. . . . On the 5th of April I again saw him, and found him still complaining of pain in both his hands, nor were his febrile symptoms at all relieved. The ulcers had now spread to the size of a seven-shilling gold coin, and another ulcer, which I had not noticed before, appeared on the first joint of the fore-finger of the left hand, equally painful with that on the right. I ordered him to bathe his hands in warm bran and water, applied escharotics to the ulcers, and wrapped his hands up in a soft cataplasm. The next day he was much relieved, and in something more than a fortnight got well. He lost his nails from the thumb and fingers that were ulce-

"rated." There is an account given by Lupton; he said, writing in the "London Medical Review" November 1800, that this equine malady was not the common grease to which horses are liable, and that he had a case of a farmer with ulcerations upon his hands, from which he inoculated a number of children, and introduced a stock of equine lymph. That was one of the first stocks of equine lymph in this country. Then Mr. Tanner, a veterinary surgeon, was the first to succeed in experimentally transmitting horse-pox to the teats of a cow by inoculating some of the liquid matter from the heel of a horse. From handling the cow's teats, he became infected himself, and had two pustules on his hand, which brought on inflammation, and made him unwell for several days. The matter from the cow, and from his own hand, proved efficacious in infecting both human subjects and cattle. In 1801, Dr. Loy published his experiments. A butcher had painful sores from dressing a horse suffering from "grease," and Dr. Loy succeeded in transmitting the disease to the udder of a cow. Matter was taken from the cow and inserted into the arm of a child. Dr. Loy also inoculated a child direct from a horse suffering from "grease" and subsequently five other children from this child. From his experiments and observations, Dr. Loy was led to differentiate constitutional grease from the merely local affection commonly known as the grease, and thus he explained the failure on the part of many experimenters to transmit what was called "grease" to the cow. Loy wrote: "This fact induces me to suspect, that two kinds of grease exist, differing from each other in the power of giving disease to the human or brute animal; and there is another circumstance which renders the supposition probable. The horses that communicated the infection to their dressers were affected with a general, as well as a topical disease. The animals, at the commencement of their disease, were evidently in a feverish state, from which they were relieved as soon as the complaint appeared at their heels, and an eruption upon the skin. The horse, too, from whom the infectious matter was procured for inoculation, had a considerable indisposition, previous to the disease at his heels, which was attended, as in the others, with an eruption over the greatest part of his body; but those that did not communicate the disease at all, had a local affection only. From this, perhaps, may be explained, the want of success attending the experiments of the gentlemen I have mentioned." Experiments with horse-pox were also made about this time on the Continent. Sacco made some observations upon this disease at Milan. Several horses were suffering from what was called *giardoni*, and Sacco's servant was attacked on both arms from dressing one of his horses with this disease. Several children and cows were inoculated from the horses, but without success. In another instance a coachman went to the hospital with the eruption on his hands, and the disease was successfully communicated to three out of nine children. In 1803 Dr. Marcet described some experiments which had been made at Salonica by M. La Font. The disease was known in Macedonia as *javart*. In one case a horse was attacked with feverish symptoms that ceased as soon as the eruption appeared. The fore legs were much swelled; several ulcers formed. M. La Font took some of the discharge from an ulcer and inoculated a cow and three children, and succeeded in transmitting the disease to two of the latter. Vaccinogenic grease was observed in Paris in 1812, and Baron cites the case of a coachman, who, after dressing a horse with the "grease," had a crop of pustules on his hands, from which the disease was experimentally transmitted by inoculation to two children. A series of inoculations was started from an infant who was infected from one of the scabs taken from the pustules on the hand of the coachman. In 1813 Mr. Melon, a surgeon of Lichfield, met with vaccinogenic grease in the horse, and some of the virus was sent to Jenner, who carried on a series of arm-to-arm equinations for some months. And again in 1817 vaccinogenic grease broke out in a farm at Wansell. The farm servants and the cows were infected, and Jenner employed this equine matter for a series of inoculations for eight months. In 1817 Baron described a case of a young man who had not less than 50 pustules on his hands and wrists from dressing a horse with this disease, and in the following year Baron obtained some fresh equine virus from the hands of a boy who had been infected directly from a horse. The disease assumed a pustular form and extended over both arms.

In 1818 Kahlert met with this equine disease in



Bohemia, and confirmed the experiments made by Loy and Sacco. Kahlert noticed that the joint of the foot was swollen, that moisture exuded from it, and that the posterior part of the pastern was slightly red and swollen, and hotter than the neighbouring parts. At the slightest touch the animal showed signs of pain; the hair was stuck together, and a clear yellowish fluid with a peculiar odour escaped. The disease was successfully transmitted to cows, and from cows to children. In 1860 the horses at Rieumes, near Toulouse, were attacked by an epizootic malady; in less than three weeks there were more than 100 cases. According to the veterinary surgeon, M. Sarrans, the animals suffered from slight fever, rapidly followed by local symptoms, the most marked of which were swelling of the hocks, and an eruption of small pustules on the surface of the swollen parts, which were at the same time hot and painful. After three to five days there was a discharge from the pastern, which continued for 8 to 10 days, during which the inflammation gradually diminished. The pustules dried up, and in about a fortnight the crusts with patches of hair fell off, leaving more or less marked scars. The eruption appeared at the same time on different parts of the body especially on the nostrils, lips, buttocks, and vulva. Sarrans believed that the mares taken to the breeding establishment at Rieumes had been infected from the ropes which had been used in tying up other affected animals, and had thereby become infected with the virus of this disease. One of the mares was taken by the owner, M. Corail, to the veterinary school to be examined by M. Lafosse. About eight days after this visit, significant symptoms appeared, loss of appetite, lameness, stiffness of both pastern joints, and a hot, painful swelling of the left pastern joint. The hair was staring, and there were vesicles on the skin, from which a liquid exuded having an ammoniacal odour, but less foetid than the secretion in *eaux aux jambes*. M. Lafosse successfully transmitted the disease to cows, and from cows to children, and to a horse. In 1863 the subject of vaccinogenic grease, or horse-pox, again received great attention in France. A student named Amyot was engaged in dressing a horse on which an operation had been performed. The leg which had been operated upon became the seat of a very confluent eruption of horse-pox, which was followed by such an abundant flow of serosity that at first the nature of the affection was mistaken, and it was thought to be a complication of *eaux aux jambes*. Amyot had a wound on the dorsal aspect of the first interphalangeal joint of the little finger of his right hand; in spite of this, he continued to dress the horse entrusted to his care. The sore on his finger was the seat of an accidental inoculation with the virus which flowed in great abundance from the horse's leg. The wound was made on August 3rd, and the next day it was swollen and rather painful. On the 5th Amyot suffered from malaise and great weakness; on the 6th, 7th, and 8th vesicles appeared successively on the fingers of his left hand, and on his forehead between the two eyebrows. On the 9th these vesicles were fully developed; those of the fingers consisted of very large epidermic bullæ on a bluish-red base. On opening them a perfectly limpid fluid escaped in such abundance that small test tubes might have been filled with it. The vesicle on the forehead was surrounded by a bluish-red areola, within which, the epidermis, of a leaden-grey hue, was raised, and had a slight central depression. The liquid which flowed from it when it was opened, and which continued to ooze, was also very abundant, and of a deep citrine colour. The vesicles which had developed on the dorsal side of Amyot's fingers, were extremely painful. The incessant shooting pains, of which they were the seat, prevented him from getting any rest for three days. I go into this case in some detail because it is a well-authenticated case in which we have direct inoculation from the horse to the human subject, and then we find we have very serious symptoms. On the 10th, inflammation of the lymphatics followed; both arms were swollen and very painful, with red lines indicating the course of the lymphatic vessels. The glands of the axillæ were also enlarged. The lymphatic glands behind the jaw were also swollen and painful. Amyot's chief sufferings were occasioned by the intense local pain caused by the vesicles on the fingers, and by the inflammation of the lymphatic vessels and glands, which continued in this state up to the 18th of August. It was only at the end of the month that the vesicles were completely cicatrized. Bouley felt very great anxiety in the presence of the grave symptoms which accompanied the eruption. The eruption on the forehead was especially a cause of great uneasiness, because

glanders manifests itself in a similar way. With virus from Amyot's vesicles the disease was transmitted to cows and to children. Further, this outbreak enabled exhaustive experiments to be made, by which it was definitely established that horse-pox is never infectious, but like cow-pox is transmitted solely by contact. In 1880 M. Baillet, Director of the National Veterinary School of Toulouse, was informed that a contagious malady had developed in the mares which had been served by the stallions at the breeding establishments at Rieumes belonging to M. Mazères. M. Peuch was delegated to investigate this outbreak, and he visited for that purpose Bérat, Rieumes, and Labastide-Clermont. At Bérat three mares were examined, in one there were scars and crusts, the remains of an eruption on the lips and in the vicinity of the vulva; in another there were several reddish circular ulcers in the same region. I need not go into the details of all these cases. On proceeding to Rieumes M. Peuch inspected 11 stallions, six horses, and five asses. On one ass there were several vesicles on the right side of the penis scattered about from the base of the free part to the glands. In another ass there was a trace of a vesicle on the penis, and a characteristic vesicle on the left nostril. In an old bay mare there were the remains of an eruption in the circumference of the vulva, and in an old white mare there were not only vesicles on the vulva, but in addition vesicles in the inner side of the lower lip. M. Peuch drew special attention to these cases as likely to be confounded with aphthous stomatitis, but the existence of the same eruption on other parts of the body is an important aid in making a diagnosis of horse-pox. At Labastide-Clermont one mare was particularly noticed. This mare had been served on the 19th and 21st April, and on the occasion of the inspection on May the 11th there were the remains of an eruption around the vulva, and lymphangitis existed in the right posterior limb which was engorged, hot, and painful in its whole extent, so that the animal walked with difficulty. The symptoms in that particular case correspond with the symptoms in a case described by Jenner. The proprietor had contracted the disease in attending to his mare and exhibited a vesicle on the thumb of the right hand excoriated and blackened but still recognisable. Some of the crusts collected from the cases at Bérat were used for inoculating a cow. The result was successful and the disease was transmitted by inoculation to a heifer and several students and children.

11,437. (*Chairman*.) Is there any record of what it was like when so transmitted, did it present the normal characteristics of cow-pox or did it differ from it?—It produced a vesicle like a vaccine vesicle. I do not show these drawings I have here for the purpose of publication, but merely to illustrate the eruption. These are copies of the original drawings showing the way in which horse-pox resembles aphthous stomatitis in affecting the mouth and lips. This one shows another form in which it affects the mouth and nostrils, and then resembles glanders. This is another case, showing the way in which the disease is conveyed in breeding establishments; in these cases it is very often mistaken for *maladie du coit* or equine syphilis.

11,438. In the horse is the vesicle a vesicle exactly like the vaccine vesicle?—In the natural disease you have a bullous eruption just as in so-called spontaneous cow-pox you have a bullous eruption, but when you inoculate from the horse, you produce a depressed vesicle resembling the vesicle of inoculated cow-pox.

11,439. But is the natural horse-pox vesicle exactly of the same character as the natural cow-pox vesicle?—Like cow-pox, as I have pointed it out to-day, with a bullous eruption, not with a central depression.

11,440. Is there ever a central depression in the natural horse-pox?—Not unless they are broken vesicles or vesicles of inoculation.

11,441. Therefore, if Ceely's account is correct, it differs in that respect from some cases of cow-pox?—His description does not, but his drawing does.

11,442. (*Dr. Collins*.) I suppose the chances of injury to the vesicles would be somewhat less in the case of a horse than in the case of a cow?—Certainly.

11,443. (*Chairman*.) Has there been any experience of the communication of cow-pox to horses?—Yes. M. Chauveau inoculated horses with cow-pox, and produced a cow-pox vesicle.

11,444. (*Professor Michael Foster*.) And an eruption?—If you inject lymph you produce a generalised cow-pox eruption.

Prof. E. M.  
Crookshank,  
M.B.

6 Aug. 1890.



*Prof. E. M. Crookshank, M.B.*  
6 Aug. 1890.  
11,445. (*Chairman.*) Is it free from difficulty to inoculate a horse from the vaccine vesicle?—It is very easy, but you cannot readily inoculate the horse with variola; and if you do succeed you get not cow-pox, but a variolous result, and if you inoculate children you produce small-pox.

11,446. Is the suggestion of these writers who thought that horse-pox was distinct from cow-pox because of the difference of its vesicle from the cow-pox vesicle erroneous; were they mistaken in their observation, or mistaken in the fact?—Whether the eruption of cow-pox can be distinguished from the eruption of horse-pox communicated to the cow, and whether cow-pox and horse-pox are identical or only analogous are questions which call for further investigation. Mr. Fleming has come to practically the same conclusion. We cannot say that it is definitely proved that cow-pox and horse-pox are identical. Possibly they are identical, and possibly when cow-pox breaks out upon a farm it may have been introduced from another farm where there was a case of horse-pox.

11,447. You think that those writers you have quoted who entirely dissent from the view of the identity between cow-pox and horse-pox by reason of what they had observed in relation to horse-pox must have been mistaken in supposing that there were characteristic differences between them?—No, I would hardly go so far as that. M. Chauveau made a very careful comparison between the vesicle inoculated from horse-pox and the vesicle inoculated from cow-pox, and Mr. Fleming points out that there are minute differences, and is not satisfied that they are identical.

11,448. (*Professor Michael Foster.*) But he found them mutually protective, did he not?—I forget whether Chauveau performed that experiment with horse-pox.

11,449. I think that you will find that he found them mutually protective one against the other?—If he did so that would be a very strong argument for their identity.

11,450. (*Dr. Bristowe.*) So that Jenner was somewhat justified in believing the horse-pox and the cow-pox to be the same disease?—He was wrong in supposing that cow-pox came from grease, but he was not so far wrong as some would imagine.

11,451. (*Chairman.*) When you say that finding them mutually protective was strong evidence for their identity, might it not also be evidence that analogous diseases, though not identical, are mutually protective?—If mutually protective that would be evidence in favour of identity. Before the Commission adjourns and while we are upon this subject I should like to add a few observations upon the nature and affinities of horse-pox. Horse-pox, like cow-pox, is a disease conveyed solely by contact, and both cow-pox and horse-pox, according to Auzias-Turenne, are analogous to syphilis in man. "Entre la syphilis et la vaccine, l'analogie se poursuit fort loin. L'inoculation de la vaccine, maladie à virus fixe, assez bien nommée *vérole de vache* peut faire naître, par exemple, des vaccinides polymorphes, et quelquefois des vesiculo-pustules pathognomoniques disséminées, de même que la contagion de la plaque muqueuse, symptôme d'une maladie à virus également fixe, donne lieu à des éruptions secondaires variées, et quelquefois à l'apparition de plaques muqueuses disséminées. Mais fort heureusement pour les vaccines, la vaccine parcourt une évolution rapide et ne laisse pas aussi longtemps, ni surtout aussi fréquemment après elle que la syphilis, des restes virulents." Reflexions sur les rapports qui existent entre le variolo et la vaccine.) "À un point de vue, le grease pustuleux inoculé offre la plus parfaite ressemblance avec la vérole inoculée par le produit des accidents secondaires. Des deux côtés nous voyons, absence de contagion par la voie de l'atmosphère, travail local, réentissement lymphatique et ganglionnaire, fermentation universelle de

"l'organisme, eruption générale et immunité acquise contre des nouvelles atteintes. À un autre point de vue, le ressemblance avec le variolo est frappante. Mais il s'en distingue énormément par l'absence de la contagiosité atmosphérique." (*Mémoires sur le grease pustuleux.*) In an early stage of the history of cow-pox, the term lues bovillæ was suggested, and it was even supposed that it actually arose from human syphilis being transmitted to the cow by milkers suffering from this disease. Cow-pox and horse-pox have been imagined by others to arise from attendants suffering from small-pox, and cow-pox and horse-pox regarded as modified forms of small-pox. This transmission has never been observed, and human small-pox belongs to a different group of diseases, and has affinities rather with small-pox of sheep and cattle plague, diseases which are not only inoculable, but highly infectious. And human small-pox is an acute disease characterised by sudden and severe fever, which is followed after 48 hours by a generalised eruption, while cow-pox and horse-pox commence, like syphilis, as a local affection, and constitutional symptoms follow in time. Horse-pox and cow-pox are followed by generalised eruptions analogous to the generalised eruptions of syphilis, and Auzias-Turenne, guided by analogy, described the generalised eruptions following "grease" or horse-pox as greasides ("comme on dit syphilides"), and those following cow-pox as vaccinides. There is no more ground for believing that cow-pox originates in human syphilis than there is for accepting the theory that it arises from milkers suffering from small-pox. There is a tendency at the present day to seek for analogy between certain diseases of man and of the lower animals, and if we follow this course in the case of cow-pox or horse-pox, and recollect that these diseases are produced solely by contact, and that the manifestations of horse-pox are sometimes venereal, and if we consider the course which those diseases run, there is obviously a far closer analogy with syphilis than any other human malady; and, further, if we study the local manifestations, we find that in some cases the likeness is so great as to baffle the most accomplished diagnostician. On this point the views of Auzias-Turenne have been supported by the historical researches of Creighton and by my own observations. Syphilis artificially inoculated on the human subject more closely resembles the casual or intentional inoculation of virulent horse-pox or of cow-pox. In inoculated syphilis we have the stages of papulation, vesiculation, ulceration, scabbing, and the formation of a permanent scar, and if we examine Ricord's illustrations and study the experiments of Auzias-Turenne, we cannot fail to be struck with the remarkable similarity to the results obtained and depicted by Jenner and Ceely and others. But in order to follow out this analogy we must study the natural and casual horse-pox, and if we are not familiar with what has been written on this subject, and if we restrict our knowledge to the artificially cultivated horse-pox, we shall not only fail to recognise the natural disease when we meet with it, but we shall be liable to attribute the results of the full effect of the inoculated virus to accidental contamination. Another question of very great interest is the relation of horse-pox to cow-pox. Jenner first of all propounded the theory that all cow-pox arose from horse-pox, or, as he termed it, "the grease," and thus cow-pox and horse-pox were manifestations of the same disease. But it was established that cow-pox also arose independently of horse-pox, and Jenner was led to distinguish between cow-pox, a disease peculiar to the cow, and the eruptive affection transmitted to the cow from the horse, which the common people by a strange perversion of terms called the cow-pox. Whether, as I have remarked before, the eruption of cow-pox can be distinguished from the eruption of horse-pox communicated to the cow, and whether cow-pox and horse-pox are identical or only analogous, are questions which call for further investigation.

Adjourned till November 12th at 1 o'clock.



## Forty-seventh Day.

Wednesday, 12th November 1890.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Mr. CHARLES BRADLAUGH, M.P.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.  
Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. BRET INCE, *Secretary*.

Professor EDGAR MARCH CROOKSHANK, M.B., further examined.

11,452. (*Chairman*.) When the Commission adjourned you were directing attention to the subject of the relation of horse-pox to cow-pox. I believe you have something to add upon that point?—I desire to direct the attention of the Commission to a paper by M. Blaise upon the venereal diseases of the horse, and to the fact that a Commission composed of Messieurs Nocard, Trasbot, and Laquerrière was appointed to examine and report upon this work. In this paper M. Blaise goes into the subject of genital horse-pox, and I draw attention to this report as showing that genital horse-pox is not so uncommon as some have supposed. In this paper M. Blaise says [*Veterinary Journal*, February, 1890, page 101], that “genital exanthema is an eruptive disease which appears in stallions and mares during the spring, and disappears in the course of from 10 to 15 days without leaving any traces behind it. The system is not subjected to any ill-effects, and the malady cures itself without treatment, although cleanliness and astringents hasten the cicatrization of the ulcers by which it is characterised. The ulcer commences as a small rose-coloured spot of a somewhat deeper colour at its periphery. This lenticular patch is soon transformed into a pimple, which, at three, or at most four, days after its appearance becomes a papule or vesicle of the size of a pea or small nut; from the fifth to the sixth day this papule softens, and a sero-purulent liquid issues from its umbilicated summit, which concretes under the action of the air into a greyish crust, covering a small cup-shaped ulcer with a granulated base, rose coloured at its margins, and paler towards the centre.” The report of the Commission points out that similar cases have been described by M. Peuch and others; and that this disease, which has been hitherto called genital exanthema, is nothing more or less than genital horse-pox. Then the report goes on to say, that Messieurs Saint Cyr, Peuch, Trasbot, Nocard, and Galtier have drawn up rules to serve as a guide on this point; that in the interests of the Government, threatened as it is by the loss of its stallions, as well as in the interest of horse-breeding in Algeria, it would be very desirable that extracts from the best works relative to the diagnosis between syphilis and horse-pox should be issued as a pamphlet, and distributed among both the civil and military practitioners in Algeria. “To sum up, two principal diseases, which must not be confounded, attack the genital organs of stallions and mares; that is to say, syphilis and horse-pox. The term genital exanthema has had its day, but must now be definitely replaced in the nosological vocabulary by genital horse-pox.”

11,453. Is that the same thing as the horse-pox or the horse-grease spoken of by Jenner; because I thought that that did not occur upon the genitals specially?—I think it is unquestionably the same disease; but it has been stated that only one or two isolated cases of genital horse-pox have been met with; and what I am pointing out is that this manifestation is not so uncommon as some imagine. The subject has been particularly studied in France; and I wish further to point out that this disease may be mistaken for horse-syphilis.

11,454. Are those symptoms you have read the same symptoms as occur in the disease which has been called horse-grease?—Horse-grease is a distinct disease which has been confounded with horse-pox; when horse-pox attacks the heels it has been mistaken for horse-grease. If you will allow me to read a little of the discussion which took place it will make the matter clear.

11,455. (*Sir James Paget*.) What is the name of the report you are referring to?—It was published by the *Société Centrale de Médecine Vétérinaire* of Paris.

11,456. (*Professor Michael Foster*.) Who established the Commission?—It was, I think, an inquiry by the Veterinary Society. I do not think it was an official Commission.

11,457. And all those doctors are veterinary doctors?—Yes. In the course of the discussion M. Leblanc says, “Too often veterinary surgeons confound horse-pox with syphilis” [horse-syphilis], “and in addressing their reports to the authorities cause much prejudice to breeders and to the exportation of horses generally by localising centres of infection of this dreaded malady which do not in reality exist; these reports are published in the papers, and hence are the means of originating alarms as unnecessary as uncalled for. To this, in great measure, is due the fact that latterly the Americans have attributed the appearance of syphilis amongst their stallions to an importation from this country; and this is the greater error, seeing that the disease does not exist in France. To avoid such errors in the future, the Minister of Agriculture has ordered that veterinary surgeons shall henceforth isolate all suspected animals in order to ascertain the existence of the infection before making a definite report thereon.”

11,458. (*Chairman*.) What is the distinction he points out, that the syphilis is more infectious than the horse-pox?—He says alarm has been created unnecessarily by calling it horse-syphilis.

11,459. Why was there more alarm about horse-syphilis than about horse-pox?—Because horse-syphilis is a very terrible disease indeed.

11,460. (*Sir James Paget*.) M. Blaise draws a distinction between horse-pox and horse-grease?—Yes. The Commissioners draw attention to the fact that horse-pox and horse-syphilis have general similarities, but that they can be distinguished by very careful examination.

11,461. What was the ground for the supposition that there is any relation whatever between grease and either of these diseases?—I do not think there is any relation between horse-syphilis and grease.

11,462. There are three diseases?—Yes, there are three diseases—grease, horse-syphilis, and horse-pox.

11,463. The grease is not related to those two?—Not at all.

11,464. (*Mr. Bradlaugh*.) It comes to this; that the disease which had been described by Jenner as horse-grease in this country had been mis-described by him, and was really horse-pox?—That is my opinion.

*Prof. E. M. Crookshank, M.B.*

12 Nov. 1890.



- Prof. E. M. Crookshank, M.B.*  
12 Nov. 1890.
- 11,465. (*Sir James Paget.*) Do you think that there is any relation between what Jenner described as grease, and horse-pox and syphilis?—Yes. Jenner described “grease” as accompanied with a generalised eruption over the body.
- 11,466. And had no relation to syphilis?—Very little relation to horse-syphilis, because that is a terrible disease commencing in the genitals.
- 11,467. And there is no relation between horse-syphilis and human syphilis?—There is no relation, but a certain amount of similarity.
- 11,468. And no relation, you suppose, between grease and horse-syphilis?—No, and I should say they were specifically distinct.
- 11,469. (*Dr. Bristowe.*) How long has the term “horse-syphilis” been used?—I cannot say who was responsible for it; the disease was originally called “*Maladie du Coit.*”
- 11,470. It is quite recent, is it not?—No, Fleming refers to it in his work published about 15 years ago.
- 11,471. I suppose you admit, when Jenner speaks of grease, that he includes all these diseases; that, at any rate, in his time, if these were distinct diseases they were not recognised as such; so that in what he speaks of as horse-grease you distinguish horse-pox, grease, and syphilis?—They were not recognised as such.
- 11,472. (*Sir James Paget.*) He had only seen the disease in the heels—he could not assume any relation between grease and any other disease he had not seen?—Not “only”; he had met with other manifestations of the disease, but principally when it affected the foot.
- 11,473. (*Chairman.*) According to your view horse-syphilis never affects the foot but only the genitals?—Quite so. Jenner first described “grease” as a disease affecting the foot; then afterwards he recognised that that was only one manifestation of a disease which affected the horse in other ways. He afterwards recognised that what he called the grease appeared in the form of a generalised eruption.
- 11,474. (*Dr. Collins.*) Do you suggest that there is any analogy between horse-pox, described by Jenner (as you think erroneously) as horse-grease, and human syphilis?—There is an analogy between horse-pox and human syphilis.
- 11,475. Would you agree with this quotation from Auzias-Turenne, which you will find on page 158 of the Report to the Veterinary Department of the Board of Agriculture for 1889: “*A un point de vue, le grease “pustuleux inoculé offre la plus parfaite ressemblance “avec la vérole inoculée par le produit des accidents “secondaires”*”?—I think that is quite correct.
- 11,476. You quote that with approval?—I quote that with approval.
- 11,477. (*Sir William Savory.*) What do you mean by “analogy”?—I have adopted it as indicating general difference with identity or sameness in certain stages.
- 11,478. In what relation do you suppose the two diseases stand to one another; can they be transmuted?—No; I look upon them as absolutely distinct, but in one or more of their stages there is a very close resemblance.
- 11,479. (*Sir James Paget.*) I observe the word “affinity” appears to be used in this connexion?—I think it is better to adhere to the word “analogy.”
- 11,480. You prefer to stick to the word “analogy”?—Yes, if by affinity you would imply transmutability.
- 11,481. (*Chairman.*) Are there not a number of diseases which while yet extremely different are analogous; for instance, in diseases which exhibit a febrile condition the temperature rises above the normal, and so on?—Yes; and, I take it, there are different degrees of analogy.
- 11,482. Would you use the word “analogous” unless there were some close approximation in the resemblance between the two throughout their course?—Yes, certainly; for instance, I have quoted the words of Auzias Turenne that there is an analogy between cow-pox and small-pox; but there is a still closer analogy between cow-pox and syphilis; because cow-pox and syphilis are communicable only by contact.
- 11,483. (*Sir James Paget.*) Does cow-pox reproduce itself in the shape of secondary symptoms in the way which syphilis does?—Yes, and the French observers lay great stress upon secondary eruptions.
- 11,484. You are aware that Auzias-Turenne himself draws the strongest contrast between syphilis and vaccinia; that while he points out that, they are in many respects analogous, he also points out that, in many other respects, they are widely different. For instance, he describes the unlikeness between syphilis and cow-pox in this way—he is referring to Ricord’s inoculations of syphilis—and he says: “Who could “really confound a conical ecthyma crusted and swollen “out with a homogeneous yellowish and creamy pus “with the bluish raised surface of a vesicle vaccine “pustule from which oozes a colourless limpid and “glutinous lymph?” Then again he says: “No one “could confound one with the other except by mis- “taking both.” The passage is really worth looking at for the striking difference there seems to be in his mind between the two diseases, notwithstanding their not being infectious and their affinity in other respects?—But surely such statements contrasting syphilis and vaccinia do not harmonise with the expressions you have used. Auzias-Turenne says, “As between syphilis “and cow-pox, the analogy can be followed a long “way.”
- 11,485. (*Chairman.*) If, looking at certain symptoms which are very much alike, it can be said that they are analogous, would it not be equally fair to say that, looking at those which are not alike, they are not analogous?—Yes, in those respects.
- 11,486. If in certain respects you find the two agree they are analogous, but if in still more respects they do not agree, upon the whole they are not analogous; could you properly say they are analogous, unless you find that in the majority of respects they agree?—I think so. I meant by using the term analogous to impress upon you that I would classify such diseases together. I would divide them into two groups. I would put such diseases as human small-pox, sheep-pox, and cattle plague into one group; and cow-pox, horse-pox, and syphilis [into the other]; and I would say that there was more in common between those of the latter with each other than with the former group.
- 11,487. (*Sir James Paget.*) Taking the resemblance between cow-pox and syphilis, would you say that the inoculated syphilis produces effects resembling those of vaccinia either on the genitals, the fingers, or the lips?—There is a striking resemblance in the drawings which Jenner has given of inoculated horse-pox, or grease, as he calls it, and Ricord’s plate. I have looked also at Henry Lee’s inoculations, and there is a similar resemblance, but the deficiency is in the number of inoculations which have been carried on.
- 11,488. You mean of syphilis?—Yes.
- 11,489. From one person to another?—Yes.
- 11,490. You are aware that a large number of inoculations of syphilis can be made upon the same person?—Yes.
- 11,491. Is not that very different from anything we can call analogous, when vaccinia can be inoculated at the most two or three times upon the same person, and then usually with some interval between them; whereas syphilis can be inoculated more than a hundred times upon the same person and at quite short intervals, and with only a gradual diminution in its intensity?—That would indicate in that respect a distinct difference between the two.
- 11,492. (*Chairman.*) I want to understand the point of this question of analogy. If analogy only means that in some of its symptoms there is a similarity between the two diseases, though in other of the symptoms there is dissimilarity, what is the point of it?—It amounts to this: that I agree with Mr. Hutchinson that if we do not understand the pathology of cow-pox and horse-pox, we shall be quite likely to say that a case which is vaccinal is syphilitic.
- 11,493. What do you mean by understanding “the “pathology”?—Unless we are acquainted with the effects of unattenuated cow-pox and horse-pox in producing ulcers, enlarged glands, and secondary symptoms. I want to draw attention to the similarities as an aid to diagnosis in future.
- 11,494. Upon that I would ask, is it not equally important to draw attention to the dissimilarities?—Yes.
- 11,495. It would be as useful to see in what points they are dissimilar as in what points they are similar?—I think the dissimilarities are appreciated, but what have not been appreciated hitherto are the similarities.



11,496. (*Mr. Bradlaugh.*) In the passage preceding that which you quoted from Auzias-Turenne, on page 158 of the Report of the Veterinary Department, he says this: "Entre la syphilis et la vaccine, l'analogie se poursuit fort loin. L'inoculation de la vaccine—maladie à virus fixe, assez bien nommée *vérole de vache*—peut faire naître, par exemple, des vaccinides polymorphes, et quelquefois des vésiculo-pustules pathognomiques disséminées, de même que la contagion de la plaque muqueuse, symptôme d'une maladie à virus également fixe, donne lieu à des éruptions secondaires variées, et quelquefois à l'apparition de plaques muqueuses disséminées. Mais fort heureusement pour les vaccinés, la vaccine parcourt une évolution rapide et ne laisse pas aussi longtemps, ni surtout aussi fréquemment après elle que la syphilis, des restes virulents," drawing the comparison and marking the distinction to which my Lord was directing attention?—Quite so.

11,497. (*Chairman.*) What I should have thought was this: that if two diseases in certain respects were similar and in others dissimilar, the important thing was to keep your eye fixed upon the points in which they were dissimilar, because then you could perfectly well distinguish whether it was one or the other?—That is of importance, but I think it is of greater practical importance to appreciate the similarities; because I think that many cases which have been described as vaccino-syphilis have been virulent cow-pox. Mr. Hutchinson, in discussing the Leeds cases, says certain cases looked to him quite as much like vaccinia as syphilis; and I think if the pathology of cow-pox and horse-pox were borne in mind, we should avoid many mistakes. Let me refer you to an account of an outbreak of horse-pox described by Mr. Fleming in "The Veterinary Record," of July 26th, 1890, page 45. He says: "But the most striking fact, to my mind, was that presented by the farrier-major when he came to me one morning and showed me his hand; there was a large vesicle on the back of the first finger, and an extensive inflammation of the skin, and it was very much swollen above the wrist. The man himself was feverish, and he was sent to the hospital. Our regimental surgeon was absent on leave at the time, and the surgeon of the Foot Guards, who saw his finger, said it was syphilis. He said his hand must have been in some improper place, and it must have been syphilised." I think if physicians would appreciate the results which frequently follow the direct inoculation of virulent horse-pox and cow-pox, a vesicle rapidly becoming a sore, which the French investigators speak of as a false chancre, and following upon this false chancre, enlargement of the lymphatic glands, and then after an interval of time a secondary eruption, which may be macular, papular, or pemphigoid; if, I repeat, diagnosticians knew that those results might follow from inoculation with cow-pox or horse-pox, they would be very careful before they said that syphilis had been inoculated together with vaccine.

11,498. Your case is that although syphilis and vaccinia are diseases differing in their phenomena in certain important respects, yet nevertheless there are certain particulars in which the one may be mistaken for the other if all these considerations are not kept well in mind. Do you think it fair to say that the nearest affinity to vaccinia is in syphilis?—That was the result of my inquiry, speaking of horse-pox and cow-pox, and I am prepared to abide by it.

11,499. You think it fairly may be said that the nearest affinity to vaccine is with syphilis?—I say the analogy of virulent cow-pox and horse-pox is to syphilis rather than to small-pox.

11,500. (*Sir James Paget.*) You would not say the "affinity"?—I would rather adhere to "analogy."

11,501. You think that the analogy between syphilis and vaccine is nearer than that between vaccinia and small-pox?—Yes, I do.

11,502. (*Chairman.*) I thought that one of the points which have been pressed upon us was that inoculated small-pox and cow-pox so much resemble one another that the earlier observers were occasionally mistaken in thinking that what they saw was cow-pox, whereas it was in reality small-pox, and that that was the case, although the observers were people who had been dealing with small-pox for years?—Yes; but Auzias-Turenne says that when you study the disease as a whole, and remember that cow-pox and horse-pox like syphilis, are only conveyed by contact, the analogy is closer with syphilis than small-pox.

11,503. (*Sir James Paget.*) Is there any case in which syphilitic inoculation has ever been so like to vaccinia as the transmitted small-pox, passed through the cow, and then through children?—The nearest is one of Henry Lee's cases, but the "vaccination" stopped; Lee did not carry on the successive inoculations.

11,504. You have yourself said that what was transmitted through the cow by Ceely and others was small-pox?—Yes.

11,505. Is it not the fact that that which was again transmitted was so much like vaccinia that neither Ceely nor anybody else could distinguish it?—I would not say they could not distinguish it; there were differences. You will find that experienced men distinctly stated that they could distinguish between them. In my own book, Volume II., page 532, Mr. Estlin, speaking of variola vaccine lymph, says: "I believe that an attentive observer who has watched different kinds of lymph (the origin of which he is acquainted with) will detect slight variations in them. Jenner described his lymph, but minute differences may be found in lymph from other sources, equally protective from small-pox. I think Dr. Gregory has lately stated that at the Small-pox Hospital virus from three different sources is in use there, each being distinguishable from the other by a practised eye."

11,506. Is any one of those derived from the cow inoculated with small-pox?—Yes, this is Estlin's letter to Badcock.

11,507. Estlin says that "he thinks"?—Yes, but he also says definitely that the variola-vaccine was different.

11,508. Does not he say that the difference between variola-vaccine and ordinary vaccine is greater than that which is there described?—No.

11,509. Therefore that ordinary vaccine may produce results as different from one another as those transmitted through the cow are from any of them. Now as regards the degree of difference, is there anything produced by the inoculation of syphilis which is very like the inoculation with ordinary vaccine?—Not to the ordinary results of vaccination, but there is a marked resemblance in that case of Ricord's of which I have given a plate.

11,510. But I am on the point of vaccine and syphilis. This is one of the plates. Do the other ones show a similarity?—I hardly remember.

11,511. With regard to the degree of likeness; I see that Figure 1 (on Plate XXIII., facing page 462 of the first volume of your book), which is the beginning of the pustular form, was drawn half-an-hour after the syphilitic inoculation; is there anything analogous to that in vaccination?—No.

11,512. Could you find anything at all approaching to a pustule in half-an-hour after vaccination?—Certainly not.

11,513. Then Figure 2, where the pustule is better marked, is taken the same evening about eight hours afterwards; is there any likeness in that to vaccination?—I am not aware that there was any pustule formed. Ricord simply describes "tumefaction of the tissues."

11,514. In the centre of it there is a distinct appearance of rising?—I repeat that is only tumefaction, and that will occur sometimes immediately after insertion of vaccine-lymph.

11,515. If you compare that with Figure 2, there is a distinctly nearer approach to what is shown on Figure 3, which has a distinct appearance of pustule?—I abide by Ricord's own written description.

11,516. You say the drawings here are like those?—I was speaking of Figure 6 and Jenner's plate of horse-pox.

11,517. But we are speaking of analogy. Let us see how close the analogy is in one case and how close in another?—But I have particularly restricted myself in the use of the word "analogous" to the consideration of the natural diseases of horse-pox and cow-pox, and the early removes as seen upon the hands of the milkers and farriers.

11,518. Taking syphilis and cow-pox, is the degree of analogy between syphilis and cow-pox so close as that between the transmitted small-pox and cow-pox?—But, pardon me, I have been particularly anxious to draw attention to *natural* cow-pox and *natural* horse-pox, and the early removes upon the hands of the milkers, and, taking the whole history of the diseases, I repeat that the

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analogy is closer to syphilis than to the natural small-pox.

11,519. (*Chairman.*) Would you kindly confine your attention to the point of vaccinia (cow-pox) and syphilis, leaving horse-pox on one side for the time, because this question followed from your statement that you considered that there was a great analogy between vaccinia and syphilis?—No; not vaccinia. I draw a distinction between vaccinia and natural horse-pox and cow-pox.

11,520. Take it as between cow-pox and syphilis: you said there was a close analogy between cow-pox and syphilis, and that syphilis bore a closer analogy to cow-pox than cow-pox bore to anything else?—Yes.

11,521. (*Sir James Paget.*) I would repeat my question whether you think the analogy between syphilis and cow-pox is closer than the analogy between transmitted small-pox and vaccine?—Yes, when transmitted small-pox is still infectious.

11,522. Is it?—In Woodville's experiments it was.

11,523. But taking the later experiments where it was more closely observed by Ceely and Badcock, because, let me remind you, Woodville's experiments were carried on in the small-pox hospitals?—I am fully aware of the importance of your question, and I do not want to be led into saying something I do not believe, or do not mean to say. If you are speaking of Badcock's lymph which is not infectious, then I should say that there was not a much closer analogy between syphilis and cow-pox than between cow-pox and transmitted small-pox; but I do look upon the infectious nature of small-pox, whether natural or transmitted, as a very great distinction from cow-pox.

11,524. Is there any evidence that in any of Ceely's or Badcock's cases there was infection?—No.

11,525. Then one would think that the analogy was not very close?—When it has arrived at that stage, the analogy between non-infectious variola-vaccine and cow-pox is closer than between natural small-pox and cow-pox.

11,526. (*Chairman.*) Will you give us exactly the points of analogy between cow-pox and syphilis in your view?—I have used this expression in reference to the natural disease and to the disease as found on the hands of the milkers. In these cases you have, as Jenner has described, a vesicle which runs on to a painful sore, phagedenic ulcer or false chancre, followed by an enlargement of the lymphatics, and in some cases by secondary symptoms, by *vaccinides* or in the case of horse-pox by *equinides*. In those cases there is, as I have said, an analogy to syphilis, meaning that the two diseases are perfectly distinct, but that when you take all those symptoms into account they are analogous. I have also quoted Auzias-Turenne as showing that there is an analogy with inoculated small-pox, but, as Auzias-Turenne says, the great difference in that case is that the inoculated small-pox and the natural small-pox are infectious, whereas the inoculated cow-pox is not infectious. When Sir James Paget asked me with regard to Badcock's transmitted small-pox, that is raising a question I have not referred to at all, because, if we look upon Badcock's and Ceely's lymph as transmitted small-pox, the small-pox has been shorn of its infective character, and then the dissimilarity between small-pox and syphilis and cow-pox is, of course, not so obvious.

11,527. And the similarity between it and vaccinia becomes greater?—Yes.

11,528. In short, the main point you are pressing is the infection as distinguished from contagion?—In saying that natural cow-pox is more like syphilis than natural small-pox, or that natural horse-pox is more like syphilis than natural small-pox, I press very strongly the absence of infection.

11,529. (*Sir James Paget.*) What difference do you draw between small-pox which has been rendered non-infectious and vaccine?—In the results of the two, to the naked eye, there is very little difference.

11,530. Could you point out any?—Only the minutest, such as Estlin drew.

11,531. Would those differences be greater than those amongst the different descriptions of vaccination?—No; Marson obtained lymph from sheep-pox which he could not distinguish from vaccine.

11,532. (*Chairman.*) Is it admitted beyond question that natural cow-pox is not infectious?—That is so, and horse-pox too.

11,533. It does not spread amongst a herd of cows, except by communication by the hand of the milker?—No.

11,534. Has that been so far investigated that it may be taken as proved, or is it only regarded as probable?—It has been definitely proved.

11,535. (*Dr. Collins.*) Has it not been uniformly found to be the case that cows not in milk will not be affected?—Yes, that is so; and cows upon the other side of a hedge, that is to say, belonging to a different farm, are not affected.

11,536. (*Professor Michael Foster.*) If you regard contagion as the difference between small-pox and cow-pox, how could you contend that small-pox which has lost its contagion is still small-pox?—I do not say it is small-pox. It is of varolous ancestry, but whether we are to speak of it as small-pox or not is a different matter.

11,537. Is it not singular that it should lose the very thing, namely, the contagion, by which you distinguish it from other maladies?—Take sheep-pox, I am not prepared to say that sheep-pox "vaccine" produces sheep-pox in man.

11,538. (*Chairman.*) Suppose you had a disease indistinguishable from sheep-pox, exhibiting all the same conditions, and the one was proved to be infectious and the other not infectious, you would say they were two entirely different diseases?—Yes, I should say they were two different diseases.

11,539. (*Professor Michael Foster.*) Your knowledge of the process of infection is so secure as to justify you in taking that view? Might not contagion or non-contagion turn upon a very little thing?—If that particular condition is permanent that would in my opinion justify a separate classification.

11,540. (*Dr. Collins.*) I think I understood you, in answering Sir James Paget's question, to say that the local phenomena which may result upon the inoculation of small-pox upon a cow may very closely resemble, even so as to deceive the practised eye, the appearances resulting from the inoculation of cow-pox?—Yes.

11,541. Should I be right in saying that similar phenomena locally may result from the cultivation of cattle-plague also sheep-pox?—Yes.

11,542. Did I correctly understand you, in answer to Sir James Paget, to say that the fact that syphilitic virus had not been so managed as to produce local results of a similar character to those resulting from the inoculation of vaccine was possibly in your mind due to the fact that it had not been sufficiently cultivated or attenuated to do so?—I have expressed that opinion.

11,543. Should I be right in saying that that might possibly account for the fact that inoculations of syphilis upon human beings, on parts other than the genital regions, had not yet been successful in producing results like those of vaccine?—Yes, it is possible.

11,544. Are you aware that M. Fournier, on page 128 of his book, cites two cases in which the inoculation of the vaccine virus on human genitals produced appearances apparently syphilitic, giving rise to most regrettable suspicions?—I am aware that that is stated.

11,545. Are you aware that M. Fournier also in the course of his work finds it necessary to put into parallel columns for the purpose of diagnosis the ordinary eruptions following the truly syphilitic vaccination in which syphilis has been communicated, and the secondary eruptions following as the result of a vaccination uncontaminated by the syphilitic virus?—I have seen an abstract of that.

11,546. (*Sir William Savory.*) Any inoculation in that region might give rise to regrettable suspicions, might it not?—No doubt.

11,547. That would be worth nothing?—By itself that would not be worth anything.

11,548. With regard to your statement as to the likeness between the vaccine vesicle and syphilis, you mentioned that they were both followed by enlarged glands; is not that term "enlarged glands" likely to convey an erroneous impression: do not glands enlarge from different causes?—Yes, they do.

11,549. Would you say that the indurated gland which follows a syphilitic sore presents the same appearance as the enlarged gland following vaccination. Would not a surgeon at once draw a distinction between



the two?—Perhaps a surgeon might, but there are cases which are very misleading. Perhaps I might mention in order to explain the position which I take up with regard to this, that I have been reading many cases of alleged vaccino-syphilis, and the only history I have been able to get in some of those cases is that there was a change in the wound, induration, followed by enlarged glands and in a few days or weeks a roseola. Such cases have been referred to by responsible practitioners as vaccino-syphilis. Why I draw so much attention to this subject is, that if you study more carefully natural horse-pox and cow-pox, and if you also study the vaccinal roseola and other secondary eruptions as described by several French practitioners recently, I think it is extremely doubtful whether many of those cases were vaccino-syphilitic, though it is stated that there were enlarged glands and eruptions.

11,550. Supposing there were any irritation of the skin of the hand or arm, is not that likely to be followed by enlarged glands? It is a notorious fact that a splinter in the finger will very likely be followed by enlarged glands?—Yes.

11,551. Now, are the enlarged glands which follow vaccination more like inflamed glands, or more like the indurated glands of syphilis?—They are more like the inflamed glands as a rule.

11,552. Then it would be more natural upon that ground to say that there is more analogy between vaccinia and a splinter in the finger than between vaccinia and syphilis?—Not at all, I take that symptom in conjunction with others.

11,553. (*Chairman.*) But as to the analogy between cow-pox and syphilis, you relied, I thought, upon the one point?—Certainly not.

11,554. What do you rely upon as indicating the closer analogy between cow-pox and syphilis than between cow-pox and small-pox, besides the distinction in regard to contagion and infection?—In the case of the analogy between horse-pox and syphilis, I said it was the whole chain of the symptoms taken together, not any one by itself.

11,555. Putting aside the point about contagion and infection, do you say that the peculiar symptoms of cow-pox more closely resembles syphilis than they do small-pox?—Putting aside contagion, the analogy would be about equal.

11,556. (*Dr. Bristowe.*) As I understand, you make a distinction between cow-pox and vaccinia?—Yes.

11,557. Do you regard them as the same disease?—Vaccinia is the name given to certain phenomena —

11,558. I ask do you regard them as the same disease?—Of course, cow-pox and vaccinia would be the same disease, if it is cow-pox which has been used for vaccination; but vaccine may also include horse-pox and sheep-pox, and cattle-plague.

11,559. Vaccinia is the result of cow-pox?—Certainly, if cow-pox is used; vaccinia is an attenuated form of cow-pox.

11,560. You do not look upon that as analogous to syphilis?—There is not the same analogy as in the natural cow-pox.

11,561. I understood you to imply that the analogy was between cow-pox and syphilis, and not between vaccinia and syphilis; do you consider vaccinia analogous to syphilis or not analogous?—I think it is analogous to inoculated syphilis, but I do not think the analogy is so marked as in natural cow-pox.

11,562. Do you think vaccinia is more analogous to syphilis than it is to small-pox; vaccinia, mind, not cow-pox; vaccinia in your sense of the term?—I should say that it is more analogous to syphilis than to natural small-pox.

11,563. (*Sir James Paget.*) Do you think it a matter of no importance in considering analogies whether one disease protects from another?—Certainly, that is important.

11,564. Do you admit that vaccinia protects from small-pox?—No, that is a point that I want to deal with more fully later on.

11,565. (*Chairman.*) Dealing with cow-pox transmitted by vaccination, it has lost, at all events, the chief point upon which you rely for your analogy between cow-pox and syphilis. You told us that the point you principally insisted on was, that whilst cow-

pox and syphilis were contagious and not infectious, small-pox was infectious?—Yes.

11,566. The cow-pox transmitted by vaccination has lost that particular feature?—Yes.

11,567. In what respect, having lost that, do you think that there is a closer analogy between it and syphilis than between it and small-pox?—Then the subject becomes highly speculative.

11,568. Why speculative? It is a question of phenomena, and comparing the symptoms of one disease with those of the other?—It is speculative in my opinion in this sense, that if you take cow-pox lymph late there will be a tendency for that cow-pox to revert to its original intensity; you may by taking late lymph reproduce in a child the phenomena of natural cow-pox; you may again get that chain of symptoms, the enlarged glands together with the generalised eruption, which many would put down to vaccino-syphilis.

11,569. But when you are dealing with analogies do you not take the symptoms generally exhibited in the course of the disease, and not the symptoms you may find exceptionally in a particular case?—In drawing conclusions as to analogy you would have to bear in mind the latent qualities of vaccine derived from cow-pox.

11,570. I am afraid I did not follow your use of the word "analogy"; I thought analogy merely meant the respects in which the phenomena were similar; you are speaking now as if there were some theory or some speculation which underlay it; I thought it was a simple question of the observation of phenomena, that you observe some in one and some in another, with certain points of difference, and if you found certain points of resemblance you said they were analogous?—Yes; I used the term analogy as meaning general difference with resemblance in one or more relations.

11,571. Analogy in that sense must be a question not of speculation at all, but a fact relating to symptoms or phenomena which can be seen and observed?—Yes.

11,572. Dealing with it in that point of view, what are the phenomena which give the analogy between transmitted cow-pox and syphilis?—I repeat, I should not have drawn attention to analogy at all with *vaccinia*. I tried to lay great stress upon the analogy between syphilis and natural horse-pox, and cow-pox, and not the transmitted attenuated form which we regard as *vaccinia*. In that attenuated form I should say that the analogy was not very close, either with syphilis or with small-pox. I have not wanted to deal with the attenuated disease; it is when it is met with in the unattenuated form that it may be mistaken for syphilis.

11,573. (*Professor Michael Foster.*) I thought those cases of Mr. Hutchinson's were one of your great arguments for the analogy between the two; but now I understand you to say that attenuated vaccinia has very little analogy with syphilis?—Yes, but do not misunderstand me.

11,574. Did you not quote those as indications of the analogy with syphilis?—Yes, and surely Mr. Hutchinson's case was not what one might call normal *vaccinia*.

11,575. (*Chairman.*) Your point is that between natural cow-pox and syphilis there are certain points of analogy; that although there is not the same analogy between vaccinia which is attenuated cow-pox and syphilis, yet that in certain exceptional instances, you do find phenomena in the case of vaccination which resemble rather the original disease, and therefore display the same analogy as the natural cow-pox did to syphilis?—That is exactly my point.

11,576. (*Dr. Collins.*) Referring to a question Sir William Savory put to you just now, as bearing upon the quotation from Fournier's work (Questions, 11,546-7), I would ask you whether you think such phenomena as this, "Une rangée circulaire de grosses pustules ulcérées" et suintantes s'était déclarée dans la région périanale "et péri-vulvaire qu'elle encadrait, simulant en tous "points une série de plaques muqueuses exulcérées," would not give reasonable ground for a suspicion of syphilis?—Yes.

11,577. Is it in such cases as that that you find corroboration of your statement that in some manifestations the vaccine reverts to the character of syphilis?—Yes.

11,578. (*Chairman.*) Is there any case in which it has happened that this vaccinia which resembles the

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original cow-pox, and so resembles syphilis, has transmitted natural syphilis to another generation?—I am not aware of any.

11,579. Or in the case of cow-pox, is there any evidence that that is transmitted to the next generation?—It has been suggested, but I have no evidence of it at all.

11,580. That would be a very marked distinction between the phenomena, would it not?—It would certainly be a distinction between the two diseases.

11,581. (*Sir James Paget.*) Is there any evidence that in any of these cases there has been a series of subsequent symptoms at all analogous to those which follow syphilis?—Not as regards tertiary symptoms.

11,582. Nor a long-continued series of what would be called secondary symptoms?—None; because, as M. Anzias-Turenne expresses it, the evolution of the disease is much more rapid.

11,583. Has there been anything more than a series of transient eruptions on the skin?—Not as a rule.

11,584. Such as might follow any specific fever. Anzias-Turenne himself mentions specifically eruption following measles. Has there been anything else which has at all resembled the syphilitic sore attributable to vaccination?—Yes, or Mr. Hutchinson would not have so much difficulty in deciding whether those cases were really vaccinia or syphilis.

11,585. But is there any such series of secondary symptoms following any vaccination which was not syphilitic as you would find regularly following in syphilitic cases?—I find it impossible to answer that question, because of the difficulty of deciding whether the cases on record are really vaccinal or whether they are syphilitic. If they are all cases of syphilis transmitted with vaccine then one would say we have no record of such symptoms as you mention. On the other hand, if Mr. Hutchinson is right that they might just as well be vaccinia as syphilis, then there are plenty of cases on record.

11,586. But take the ordinary case of eruption following vaccination; do they ever follow so prolonged a course or are they ever of the same class as a syphilitic eruption?—Perhaps not so prolonged a course, but there is very great similarity between them according to the French authorities. It would be impossible for me to go into detail in these cases; and I would refer the Commission to the article upon vaccine in the Dictionnaire de Médecine, and in the Nouveau Dictionnaire de Médecine et de Chirurgie Pratique (by A. D'Espine).

11,587. (*Professor Michael Foster.*) I wish to be quite clear as to your position; these resemblances to syphilis, which appear to a certain extent with the ordinarily cultivated vaccine, which are more striking in natural cow-pox, and which are more especially illustrated by the history of the horse-pox, would, I understand you to say, guide you in classifying the diseases; you would put those diseases near each other in some classification or other; but I also understand you to express no opinion whatever as to how far the resemblances would justify you in concluding that those diseases were actually allied in their nature?—I have not expressed that opinion.

11,588. You have not expressed an opinion that they are allied in their nature, and are therefore more likely to be transmuted into each other. Upon that point you express no opinion?—My opinion is that they are not allied in that sense to each other.

11,589. (*Sir William Savory.*) Do you mean to say that such a case as that which Dr. Collins read to you, you believe to be evidence of the affinity or analogy between vaccinia and syphilis?—I understand in that case there were mucous patches and other phenomena.

11,590. Having regard to what the specific features of syphilis are, in that account would there be no more reasonable explanation of the result than that it was due to a syphilitic action?—On reading the original of this account, I would only say that the symptoms here would be suspicious.

11,591. It might be due to syphilis or it might be due to other causes?—Yes.

11,592. But that is a very different thing from admitting it as evidence of a close analogy between vaccinia and syphilis?—Yes.

11,593. (*Dr. Collins.*) My question was whether that quotation from Fournier was one of the kind of facts upon

which you justify your analogy between syphilis in man and vaccine?—Yes; but, taking that fact alone, I should not attach much importance to it.

11,594. (*Sir James Paget.*) Is there any record at all that vaccinia transmitted to the genital organs produced symptoms like that; children, for instance, may scratch their vaccine sore, and then scratch their perinæum; do they have such symptoms?—I am not aware of that, but in the case of horse-pox—

11,595. But we are now upon vaccine?—But some "vaccine" is derived from horse-pox.

11,596. Is it employed upon the genital organs, or upon the foot?—It has been derived from the genital organs.

11,597. But they do not commonly so practise it, do they, surely?—Not commonly, certainly; but horse-pox lymph is in circulation; one does not always know where the lymph is taken from; you will find in the account I have given of M. Peuch's researches that a case of genital horse-pox was the source of one of the current stocks of lymph. [Crookshank, Volume I., page 402.]

11,598. (*Professor Michael Foster.*) Where is the statement that beyond certain experimental cases the stock was continued in use; Dr. Salamon vaccinated children who had very fine vesicles—the lymph now in use is principally from Bouley's cases?—And Layet's cases; some of his stocks were raised from horse-pox. He has raised fresh stocks of equine lymph upon three or four separate occasions.

11,599. Had those been from vesicles on the genital organs?—In one case he says from the nose; the others he does not mention.

11,600. Is there any record of that lymph having been derived from the genital organs?—There is no direct statement in reference to Layet's stocks; but I may say that he gives you in his book, which is a practical treatise on vaccination, a picture of genital horse-pox; so that although he does not say he took the lymph from that region it leads one to suppose that he did.

11,601. Still the eruption is not limited to the genital organs, and in Bouley's cases the eruption was general, and very little was said about the genital organ?—No doubt; but that appears from the cases I have given to be the most frequent manifestation of it.

11,602. You have no cases to give to show that the lymph is taken from the genital organs?—Only in Peuch's case.

11,603. (*Sir James Paget.*) My question was whether it was the practice to vaccinate from the eruptions upon the genital organs?—I said that it had been done from one case.

11,604. That was an experimental case?—Yes, and the lymph was then used on several children.

11,605. (*Dr. Collins.*) What were the results in the experimental case?—There were fine vesicles of the character of the vaccine vesicle.

11,606. (*Chairman.*) I think the next point to which you wished to call attention was under the head of re-vaccination?—I am anxious to direct the attention of the Commission to certain facts with regard to revaccination, more particularly those which were brought to my notice by M. Layet himself. I should like first of all to direct attention to the following table by M. Lalagade quoted by M. Colin showing the result of a number of re-vaccinations performed by him:

Age of Re-vaccinated.	Success of Re-vaccinations per 100.
5 to 10 years	8.75
10 „ 15 „	46.29
15 „ 20 „	47.76
20 „ 25 „	50.31
25 „ 30 „	50.00
30 „ 35 „	49.39
35 „ 40 „	26.55
40 „ 45 „	12.63
45 „ 50 „	12.77
50 „ 55 „	10.20
55 „ 60 „	9.09
60 „ 65 „	6.25
65 „ 70 „	10.25



Now, I propose to direct the attention of the Commission to some very much more exhaustive experiments which have been carried out by M. Layet with calf lymph; but before doing so I should like to draw the attention of the Commission to the altered condition of our knowledge with regard to re-vaccination in this country and in Ireland. For instance, in a paper published in 1882 by Dr. Burke, "Observations on the present Epidemic of "Small-pox" (that was in Ireland), Dr. Beatty made this remark: "I have been surprised at the way in which persons—generally boys and men whom I had vaccinated, and who bore the most splendid marks, specimens that they would take to their graves of successful vaccination—have taken re-vaccination, and at the vesicles, perfect as those you would see on an infant, that have formed on their arms. In many cases of adults, aged from 20 to 30, I have seen the most perfect vesicles formed; and in the cases of younger persons the vesicles have been so beautiful as to deserve to be drawn as specimens of the disease." Then I should like to draw the attention of the Commission to a statement by Pfeiffer, in Germany, where such results are not at all surprising. Here is a *précis* of his statement on pages 54–55 of his book: In the Duchy of Meiningen re-vaccination since 1859 has been practised on school children of 13 years. Successes: 70 per cent. to sometimes 80 per cent. (Dr. Bender of Hamburg)—method employed arm-to-arm. Elsässer refers to 75 to 82 per cent. in Wirtemberg in the school children of 14. In recruits, 21 years old, 65 to 75 per cent.; and in older persons, 25 to 78 per cent. Flintzer, in 1875, gave for Saxony 74·5 per cent. Re-vaccinations in the Prussian army, according to Prager, gave 63·21 per cent. in nearly 2,000,000 inoculations for the years 1833–67. In the Wirtemberg army in 1854–1868 the re-vaccinations gave 74 per cent.; in the Bavarian army, 40 to 50; in the Baden army, 39·8. Haffter mentioned in a surgical journal, 80 per cent. in military re-vaccinations with glycerine lymph. In the kingdom of Saxony, in 1880, amongst 63,624 re-vaccinations there were 90 per cent. successful. Pfeiffer, however, points out that some of these statistics are rather incomplete, because the kind of lymph used and the irregular and often abortive course of re-vaccination have not been taken into account; but when we come to Layet's recent and more exhaustive experiments we have very much more satisfactory details. He first of all gives some account of the vaccination of conscripts. In 1883 the proportion of success of re-vaccination was 59. Then he gives a table of the vaccination of children, the re-vaccination of scholars, of the re-vaccination of the civil population, and the re-vaccination of adults. The average success in primary vaccination of infants was 91; the average for the re-vaccination of scholars was 41; and for the civil population 42; and for the military population 55.

11,607. (*Sir James Paget*) Does he give any figures according to age or the re-vaccination?—Yes. Then I want to draw attention to his remarkable series of experiments which I believe have not been equalled at all for completeness and accuracy, of vaccination in children. As they were anticipating an outbreak of small-pox at Bordeaux it was thought desirable to re-vaccinate all the children in the schools; so he carried out 6,000 re-vaccinations, and subsequently the number was increased to 10,000; and those re-vaccinations produced results which were exceedingly surprising to M. Layet himself. In children from six to seven years he produced typical vesicles in 47 per cent.; from seven to eight years, in 44 per cent.; from eight to nine years, in 47 per cent.; from nine to ten, in 49 per cent.; from 10 to 11, in 48 per cent.; from 11 to 12, in 47 per cent.; from 12 to 13, in 46 per cent.; at 13 and above, in 46 per cent. I should like to put in this table. (*The table was handed in. See Appendix I., page 407.*)

11,608. (*Chairman.*) Was it ascertained that all those children had been previously vaccinated?—Yes, those were re-vaccinations.

11,609. I ask that because he speaks of the "vaccination" of all the children in the schools?—He speaks here of re-vaccination.

11,610. But he did not confine his vaccinations, I take it, when this outbreak was anticipated, to those who had been previously vaccinated?—No, but these are the tables he gives of the children re-vaccinated.

11,611. (*Sir William Savory.*) Does he refer to the scars?—No, he does not describe them.

11,612. (*Professor Michael Foster.*) Does he give the per-centage of those who had not been vaccinated before?—No, there is no statement made as to that; but these were re-vaccinations, and he points out as the conclusion of his researches that—

11,613. (*Chairman.*) One would have thought that one of the first points that would have occurred to persons who were making this kind of investigation would have been this. He does give the proportion of the successful in the unvaccinated?—Yes, the average was 91 per cent.; and the tables that I have handed in give the proportion that took amongst the re-vaccinated.

11,614. (*Sir William Savory.*) What is the evidence that they had been previously vaccinated?—His statement.

11,615. Upon what ground is that statement based?—He is one of the principal vaccinators in France.

11,616. Did he depend upon the scars upon the arm or the report of the parent?—There are no details of the scars. I am simply giving the tables he has published, and the grounds upon which he points out that the auto-protection of cow-pox is far more limited in duration than we have been led to imagine hitherto.

11,617. (*Mr. Meadows White.*) Was there any law at the time that the children should be primarily vaccinated on entering the school, as in some of the German governments?—I think not. I think the custom in Paris is that the mother is given half-a-crown if she has her children vaccinated.

11,618. (*Dr. Collins.*) You are quoting from M. Layet's work. He quotes M. Kelsch as saying that the number of cicatrices resulting from infantile vaccination does not make any difference in the results of re-vaccination. The proportion of success has been nearly equal in those with five or six scars or with only one and the worst result appeared in those which did not show any apparent scar?—Yes, but Layet does not give the details in each individual case. Then in his recent work "*Traité pratique de la Vaccination Animale*," he says that in 1885 and 1888 he proceeded each year to the re-vaccination of children, and those re-vaccinated without success in the preceding year; and altogether about 12,000 children have been re-vaccinated, and the average success upon those re-vaccinated for the first time has been even greater than it was in 1884, it has varied from 49 to 50 per cent., and in children re-vaccinated without result in the preceding year, the attempt was made to vaccinate them again, and the proportion has been from 15 to 18 per cent. Then I must point out that in those which Layet speaks of as success, 40 or 50 per cent., he does not include cases which are in this country called by some vaccinators cases of re-vaccination success, he only speaks of "success" in those cases in which he produces typical vesicles like primary vesicles.

11,619. (*Chairman.*) Does he say typical primary vesicles?—Yes, he uses those words; and small vesicles, with a good deal of local irritation, he calls "*fausse vaccine*," so that if the *fausse vaccine* is included, as I believe it is by some vaccinators in this country as "success," his number is very much larger, some 70 or 80 per cent. of success. He says: "In our results we have used the term '*fausse vaccine*' as applying to every pustule which did not present the true character of the vaccinal pustule." He says: "There are, however, degrees between simple inflammation and *fausse vaccine* which it is sometimes very difficult to distinguish from true vaccine;" still he only considers those cases as perfectly successful in which there was the true typical character of the vaccine pustule. I can further support that statement by showing you an illustration in his book in which you will see that those cases which in this country would be considered as re-vaccination successes he speaks of as *fausse vaccine*. In Plate XXI. in his book he gives an illustration of the *fausse vaccine*.

11,620. There is a very marked discrepancy between the results he obtained and the results obtained by the first French observer you spoke of?—Yes, but these re-vaccinations have been carried out with calf lymph and reported in much greater detail, and the successes have been very much greater. These are all calf lymph vaccinations, either cow-pox from the calf or horse-pox conveyed to the calf.

11,621. But you must have a considerable number in order to be sure that you have the average proportion?—Layet has inoculated more than 12,000 children.

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(*Chairman.*) But if somebody else has inoculated a considerable number with a similar result you ought to take them all together; take M. Layet's from six to seven years, the boys give 38 per cent. and the girls 42 per cent. of successes, showing a difference of 4 per cent. of success; between eight and nine you find the girls 47, and the boys 40 per cent. I do not know whether there is some difference between the boys and the girls at those different ages which would make that a constant result everywhere. (*See Question 11,704.*)

(*Mr. Picton.*) *Fausse vaccine* being excluded, if you have that in addition that would probably make a considerable difference.

11,622. (*Chairman.*) But, if the other observer had included the *fausse vaccine*, instead of being so much less it would have been so much more. (*To the witness.*) What was the result of the other observer?—I have handed in the results given by Lalagade. I only quoted them to show the change of opinion which has taken place. I may say that Layet's observations are borne out by the German re-vaccinations, which I quoted from Pfeiffer. In Pfeiffer's list they included every thing which "takes," they included the *fausse vaccine*; now if you add Layet's *fausse vaccine* to his successful results you get practically the same results in the cases of Layet as in the German cases. In the Duchy of Meiningen the results were 70 to 80 per cent., but then, as Layet says, we are not told what proportion of those were typical vesicles.

11,623. But you are told that in the case of Layet?—Yes; Layet only includes those which were a perfect success.

11,624. (*Dr. Bristowe*) You say that in certain cases he speaks of the occurrence of what he calls *fausse vaccine* and you added that between the false and the true vaccine there were a series of gradations about which it was very difficult to speak definitely, and I understood that these were included amongst the true?—No; they were not included amongst the true; though Layet says that some of those cases are difficult to distinguish from the "true."

11,625. I want to know which he included?—Only those which exhibited the true classical character.

11,626. Would you read that passage again, because I misunderstood you?—He says, "The vesicles of the 'second inoculation, which we designate under the 'name of re-vaccin, develop normally like the first [*évoluent normalement comme les premiers*];" and he says in another passage (this is from his report in 1884): "In our results we have used the term '*fausse vaccine*' as applying to every pustule which 'did not present the true character of the vaccinal pustule. There are, however, degrees between the false vaccine which only differs slightly from the simple inflammation produced by the point of the lancet and the false vaccine which is sometimes very difficult to characterise from true vaccine."

11,627. Where does he place the false vaccine?—He gives a separate column for the false vaccine; he gives three columns, "Success," "False vaccine," and "No success."

11,628. (*Chairman.*) One observes very considerable diversity in Layet's table at 13 years of age between boys and girls. At 12 years the boys give 43 per cent., and the girls 46 per cent.; but at the age of 13 and upwards amongst the boys they give 32 per cent. only, and the girls 46 per cent., which is a very great difference. I do not know whether that may indicate that owing to there being a smaller number of girls the girls did not approximate so much to the total results. There were only 97 girls out of whom 45 were successfully re-vaccinated, which gives a proportion of 46 per cent., whereas in the case of the boys the experiment was with a larger number, namely, 329, but it is a very considerable difference in the result?—That is so.

11,629. (*Professor Michael Foster.*) Is M. Layet the Public Vaccinator at Bordeaux?—Yes.

11,630. Could you say what number of primary vaccinations were done by himself?—I could not.

11,631. Or by whom they were done?—No, they may have been done by Dr. Dubreuilh, because, if I remember rightly, M. Layet was not then in office; but I give my answer entirely for what it is worth. Dr. Dubreuilh was also a leading vaccinator. You may judge of his reports by his re-vaccination of adults. This is not an isolated table which I have handed in; Layet has contributed very largely to the literature and statistics of vaccination.

11,632. Does he give tables of the re-vaccination of adults?—Yes; he has given several tables. I have read some of them. He gives, for instance, for soldiers at Bordeaux, 90 per cent., in another batch 80 per cent., and in another 97 per cent.; he gives the ages approximately. 597 were young soldiers, and they were re-vaccinated from the calf; and in those particular cases there were 50·5 per cent. of successes.

11,633. (*Chairman.*) Does he explain how he selected the cases he re-vaccinated?—No.

11,634. Because I observe that there were frequenting the schools 5,866 children, of whom he vaccinated 3,180, so that the number he vaccinated was something more than half those attending, girls and boys. Then comes a smaller number of pupils attending, namely, 4,225, of whom he vaccinates 1,729. Does he say how the selection was made, and why he vaccinated some and not the others?—No.

11,635. He may have re-vaccinated those who did not display such good signs of primary vaccination as others?—No; he would not have come to the conclusions he has come to, if that had been the case; he does refer to the character of the primary scars; and he also published a paper in the "*Revue d'Hygiène*," in which he emphasizes his view that our ideas with regard to the term of protection of cow-pox must be changed, and he could not have laid such stress upon his results if there had been any ambiguities in his work. I was leading up to the conclusion he comes to, he says, "There is no question that the immunity varies very much in different individuals at different ages," and he looks upon this 40 to 50 per cent. of re-vaccination success as an indication that the children were perfectly susceptible to small-pox. Therefore he insists that vaccination should be compulsory in infancy and re-vaccination compulsory from six to eight, a second re-vaccination compulsory from 14 to 16, and a third re-vaccination from 20 to 25.

11,636. Why does he suggest that as the result of these experiments; because the people from 13 and upwards were no more unprotected than from six to seven; why did he not suppose that if they were done again from six to seven they would be as well protected?—He has also done a series of third vaccinations in which you find again that he gets a large proportion (using animal lymph) of successful vesicles, so that he is convinced that the immunity only lasts a very short time, and that the vaccination must be performed in infancy and repeated again between the age of six and eight, that being the time when in France they enter the schools; between 14 and 16, that being the time when they enter the colleges; and between 20 and 25, that being about the time when they go into business or the army.

11,637. (*Professor Michael Foster.*) Was there any evidence that those who did not offer any susceptibility had been vaccinated a second time since their primary vaccination?—No; but on a second attempt to re-vaccinate there were many successes.

11,638. The noble Chairman called your attention to the fact that those at an advanced age were apparently not more susceptible to re-vaccination than those at a more tender age. To explain that one must suppose that between the primary vaccination and the re-vaccination a second re-vaccination intervened. Is there any evidence that that was the case?—No.

11,639. (*Sir James Paget.*) Did you not read that upon the re-vaccination of recruits the proportion varied?—It varied from 50 to 90, according to the different batches of men. I put forward as possibly one explanation of that, that M. Layet has three or four assistants; that he presides at the sittings, and that it is quite possible there may be slight differences in the figures according to the particular operator; we know that some operators have more success in performing re-vaccinations than others.

11,640. (*Dr. Collins.*) Did I understand that you confirm the experience laid before us by Surgeon Nash to the effect that re-vaccination is more successful or at any rate not less successful in the younger classes?—Apparently.

11,641. Did you happen to notice what M. Layet says as to the influence of primary vaccination of scholars upon subsequent vaccination?—I have read it.

11,642. M. Layet says on page 270 of his "*Traité pratique de la Vaccination Animale*": "One is almost entitled to profess the opinion that very well-marked cicatrices are an indication of greater susceptibility to fresh inoculation, that is to say, that the more the



"primary vaccination marks are large, the more one is likely to find the vaccination take again, and this in effect is what Dr. Lalagade, of Albi, has recently [February, 1887] communicated to the Academy"?—As a matter of fact in France they have never attached importance to the number or size of the scars; they have always rejected the scar theory. You will find that on page 314 Layet says, "There is nothing to show that the size or depth or character of the cicatrices is in accordance with the duration of the immunity conferred by the operation;" and practically that is the opinion of all the French vaccinators.

11,643. (*Professor Michael Foster.*) Dr. Lalagade holds distinctly the view that the largeness and the more marked character of the scar indicates susceptibility to the virus, and that accordingly those who in their first vaccination give the best scars are most susceptible to the re-vaccination?—I do not know Lalagade's papers, but nearly all vaccinators hold that the scars do not indicate any relation to the susceptibility either to cow-pox or small-pox.

11,644. (*Chairman.*) I observe that Layet's results differ very much in the different schools; of course the numbers are not very large; but in some cases there is a very small per-centage of success; in others a very large one. There does not seem to be any sort of uniformity in the different schools, he gives the different days upon which the different schools were re-vaccinated?—I think one has to take the numbers as they stand. I have visited M. Layet; I have seen the whole of the working of his staff, and his results are very carefully recorded; he is a very conscientious worker; there are one or two things of course that I should have liked to have seen discriminated, but such a thing has not been suggested or heard of before apparently. For instance, for some of these vaccinations they have used stocks of cow-pox lymph, such as from the cow-pox discovered at Eysines; for others they have used horse-pox lymph; these are all put together as "vaccinated," but of course it is quite possible that if you vaccinated one batch of children with vaccine recently derived from the horse, and another with matter from the cow, you might get different results.

11,645. They were not all vaccinated from the same source?—No; they were using different stocks of lymph.

11,646. (*Mr. Picton.*) But all through the calf?—Yes.

11,647. (*Sir James Paget.*) But with regard to horse-pox lymph, if they used horse-pox lymph that would be transmitted through the calf?—Yes.

11,648. (*Dr. Collins.*) Does not M. Layet give the effect of primary vaccination of adults?—He does give some figures. Here is a column of young soldiers, some vaccinated and some re-vaccinated upon their arrival. He puts together however, unfortunately, those who have had small-pox and those who have not had small-pox and not been vaccinated, and he gets the proportion of 72 per cent. of vaccination successes; of the 520 soldiers he gets 51.75. Old soldiers vaccinated without success in 1884 were vaccinated again with animal lymph upon this occasion, and gave 55 per cent. successes. There is another important point that I wish to direct attention to, namely, the results which M. Layet obtained on making repeated attempts. The total re-vaccination successes are much greater when the attempt is made a second and a third time. He gives cases of children and adults failing re-vaccination upon the first and second attempt, and then taking typically upon the third attempt.

11,649. I think he makes this remark upon page 268: "As to the duration of the acquired immunity we now know that it is an affair of age, of health, and of organic predisposition?"—Yes, he does. I should like to direct attention also to the statements by Colin, who had immense experience of small-pox in Paris, and he quite independently uses almost the same words as M. Layet. I would beg to put it in in the original. It is to the effect that we must in future look upon the protection by cow-pox as extremely transient, and he adds that the vaccination of infants must only be regarded as the first of a series of successive operations. The original is as follows: "Concluons donc que la préservation vaccinale est essentiellement temporaire, qu'elle l'a toujours été, et que la vaccination de l'enfant ne doit être considérée que comme le commencement de la série des inoculations successives

"à imposer à chaque sujet; il faut que le public cesse de regarder la première de ces inoculations comme une opération complète, définitive, et soit bien convaincu de la nécessité d'y revenir plusieurs fois." (*La Variole*, 1873.)

11,650. (*Sir James Paget.*) Are there any statements in any of these papers as to the facts concerning the susceptibility to small-pox being at all parallel to the susceptibility to re-vaccination?—Those authorities regard the susceptibility to vaccination as being an indication of the susceptibility to small-pox, and that the 40 per cent. of children who gave typical vesicles were all susceptible to small-pox.

11,651. Could you give any facts to show that? A child might be susceptible to re-vaccination and yet not be so susceptible to small-pox as one who had never been vaccinated?—There are no facts to support your theory that I know of; if a child were perfectly susceptible to re-vaccination I should look upon it as being susceptible to small-pox.

11,652. (*Chairman.*) But not necessarily susceptible in the same degree. Is it not a more severe trial of susceptibility to have the poison actually introduced than merely to be in the way of receiving it through the air?—No doubt the chances of infection are less.

11,653. (*Dr. Collins.*) Do you agree with Dr. Gayton, who said, in answer to Question 1837: "So long as he is liable to be affected by vaccination, so long I imagine is he liable to take small-pox"?—Yes; and if cow-pox were modified small-pox, they would be more susceptible to small-pox than to re-vaccination, because under the law of viruses the strong virus will have more effect than the weak virus.

11,654. (*Chairman.*) Does that conclude what you have to say upon the subject of re-vaccination?—There is one other point to compare with these re-vaccination successes. Voigt in Germany says that the vaccination of those who have had small-pox gives the same result as in re-vaccination. Voigt at Hamburg vaccinated 300 persons who had had small-pox in the 1870-71 outbreak, and he obtained the same success as in the re-vaccination of infants who were vaccinated at the same period.

11,655. (*Sir James Paget.*) Is not that in some degree evidence that the children might be more susceptible of vaccination than of small-pox?—It is evidence that small-pox does not protect against cow-pox.

11,656. (*Chairman.*) Your next point had reference to horse-pox after cow-pox?—I have tried to ascertain any experiments bearing upon the question of protection between cow-pox and horse-pox. At the conclusion of the last sitting of the Commission, Professor Foster drew my attention to a paper. As far as time has allowed me, I have run through Chauveau's work, and I should be glad to be furnished with the reference.

11,657. (*Professor Michael Foster.*) I have myself been unable to find these observations, although I was under the impression that he had made them?—I do find one reference which bears on this question. It refers to the results of inoculation of horse-pox after cow-pox; but there is such an interval of time that one cannot absolutely say from this that cow-pox does not protect for a time against horse-pox; and that is an important point in connexion with establishing whether horse-pox and cow-pox are really identical or not. It refers to an outbreak of horse-pox in France: "With regard to the soldiers in France who were inoculated, lymph was collected from these pustules with the greatest care, that is, from the pustules of the mare, and seven young soldiers of the 10th Hussars were inoculated. On the sixth day six men showed a decided inoculation. From four soldiers lymph was taken. With this 64 men were inoculated, eight of whom had never been vaccinated. In 40 of these the results were favourable—60 per cent. had been successful." So that if cow-pox does protect against horse-pox that can only be for a time, because in these experiments young soldiers who had been vaccinated were afterwards inoculated with horse-pox; the results being successful in 60 per cent. of the cases.

11,658. (*Sir James Paget.*) That is not much more than if they had been vaccinated?—That is so.

11,659. (*Professor Michael Foster.*) Did not Bouley make some observations as to the relative effect of horse-pox on cow-pox; that is to say, with regard to the identity of natural horse-pox and natural cow-pox?—I cannot say.

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11,660. (*Chairman.*) The next point you wished to make some observations upon had reference to the variolous test?—In investigating the history of this subject I have been closely following the experiments with regard to the variolous test, and I should like to put before the Commission the evidence as it comes to hand. First of all, there is the case given of James Phipps, who was inoculated shortly after inoculation with cow-pox, I think six weeks afterwards, without success. Then Jenner relates ten cases which were inoculated with small-pox after casual cow-pox, contracted at various ages. I think Jenner's experiments are very unreliable, because, in the first case, in inoculation of small-pox only a few weeks after the primary inoculation with cow-pox, there is the fallacy that inoculation would prove under such circumstances abortive; more than one inoculator had pointed out that inoculation was likely to fail if there were any eruption or any other co-existing malady. For instance, Kirkpatrick draws attention to the fact; he says, with regard to inoculating small-pox, it was only reasonable that care should be taken that the patient was not suffering under some other disease at the time.

11,661. Is there any evidence what proportion of cases of people inoculated with small-pox virus, who had never had small-pox, failed to suffer from the disease?—I think that in Sutton's cases it was something like five per cent. Willan also in his work upon vaccine inoculation says that the existence of contagious disease sometimes impedes the formation of the variolous vesicle. The first experiment of Jenner's was certainly open to the objection that it had been performed so shortly, only a few weeks, after the performance of the original operation.

11,662. (*Sir James Paget.*) Have there not been cases in which the people have been vaccinated and then four or five days afterwards variolated, in which the variolous inoculation was not hindered in its course?—That is so. In Phipps' case it was not that the two diseases were exactly concurrent; he was inoculated when recovering from the cow-pox.

11,663. I suppose those were not the only cases in which the people were inoculated with small-pox after being vaccinated?—That is what we are coming to. I must say I agree with several writers that so far as Jenner's experiments went the experiment was very uncertain; especially with regard to the milkers who had had cow-pox sixty years before. We know that a person who had cow-pox in youth would not be protected when he was sixty years of age; so that those cases which are recorded as instances of the life-long protection of cowpox are absolutely fallacious.

11,664. Can you say why that five per cent. who had not had small-pox did not take it on inoculation?—Possibly they were cases of individual insusceptibility; possibly, as Brown of Musselburgh pointed out, those milkers had already had small-pox. A man before he became a milker would be 17 or 18 years of age, and during these years he might have had so slight an attack of small-pox as not to recollect it.

11,665. Is it not possible that if the milkers had had cow-pox when they were adults they would have remembered it if they had afterwards had small-pox?—Yes, and some did; but they may not have remembered if they had had small-pox when they were children.

11,666. Was not the contrast constantly drawn that in those who had not had the disease, inoculation was successful, except say in 5 per cent.; but that, in those who had had the milker's disease it was not successful?—There were varying opinions; there were some who said that milkers who had had cow-pox were inoculated afterwards with small-pox with success, but those were eliminated by the advocates of cow-pox by calling them spurious. Pearson reported cases of failures to inoculate, yet he wrote afterwards and said, "I have heard of cases of natural small-pox after cow-pox."

11,667. Is it not the fact that hundreds of persons were vaccinated, and then in the time when inoculation was more frequent they were inoculated without success, even two or three months afterwards?—That is what I am coming to. In Jenner's Inquiry you have James Phipps' case and the cases of milkers of various ages. To unprejudiced people at the time those cases were not convincing, but when Woodville appeared upon the scene then the profession was convinced. Woodville's cases, especially those that he inoculated at the Small-pox Hospital, practically convinced the whole profession. Take the statement made by M'Ghie: "Suffice

" it to observe, that the trials which were made by the profession, to communicate variola to those whom they had vaccinated, completely failed. The cow-pox having thus triumphantly undergone the experimentum crucis, vaccination was soon eagerly adopted by the unprejudiced and disinterested in every country to which the vaccine lymph was conveyed." [M'Ghie, "Thoughts on Vaccination," Dumfries, 1827, page 11.]

11,668. (*Professor Michael Foster.*) That does not limit it to Woodville?—He is pointing to the time when it was taken up by the profession; it was taken up by the profession from the time of Woodville's experiments.

11,669. (*Chairman.*) Was not it within a very short time made the subject of similar experiments in other countries?—Yes, in Germany and in France, but I have already shown that it was Woodville's lymph that was being used in Germany and France, and that Woodville's lymph, the "World's vaccine," was really variolous. Sir John Simon in his report refers to those cases of Woodville at the Small-pox Hospital as definitely settling the question of protection against small-pox. As I have pointed out, these cases were, to say the least of it, vitiated by the presence of small-pox, and, in my opinion, it was small-pox lymph that was being used.

11,670. (*Sir James Paget.*) Was not that observation made in every part of the kingdom?—Undoubtedly. I have given the cases in detail, and you will find that what they were using was not cow-pox but small-pox.

11,671. (*Chairman.*) Did every observer find that the disease was small-pox?—Not every observer; but I have given many cases in which the variolous test was applied; and when you come to examine them you find that the people were inoculated with Woodville's lymph.

11,672. (*Dr. Bristowe.*) You stated that this lymph went all over the country, and that the people were inoculated with this variolous lymph?—Yes, but they were not all tested afterwards.

11,673. (*Chairman.*) Is your case this: that in England, France, Italy, and Germany, in all cases where the variolous test was applied, the people were under a delusion in supposing that they were vaccinating—that they had been really inoculating small-pox?—Yes, in all those countries where they used the Woodville lymph.

11,674. (*Professor Michael Foster.*) What is your evidence of that?—I have already given it. We must remember that after those 2,000 Woodville cases it was said that there was no need to test the matter any more.

11,675. But surely they went on testing for a number of years afterwards?—I have endeavoured to find a definite set of cases tested with small-pox after inoculation with lymph known to be derived from cow-pox or horse-pox.

11,676. In what years did Brown live?—Brown of Musselburgh was vaccinating from 1800 onwards.

11,677. He published his book in 1809, did he not?—Yes. I should like to point out that there were no doubt other cases, but it is very difficult to differentiate them; for instance, I cannot say exactly what was the source of the lymph in Stevenson's cases. Stevenson applied the variolous test.

11,678. What is your proof that the whole of the lymph that was used was the Pearson-Woodville lymph?—I do not say that the whole of the lymph that was used was the Pearson-Woodville lymph, but after those cases (which are quoted as the stock cases to show protection) I am not able to distinguish what lymphs were put to the variolous test.

11,679. Those who used the lymph, from whatever source, found by their own experiments afterwards that their subsequent variolation was fruitless. It was not that the cases which occurred at the Hospital were always referred to. Each person satisfied himself by his own experiments, and the parents insisted upon the inoculation test being tried in order to show that the children had been properly vaccinated. What is your evidence that the whole of that lymph was from Woodville's source, when other sources are referred to, such as Pearson's. Pearson got lymph from sources other than that of Woodville; and Jenner himself had a supply, taken direct from Kentish Town, which he gave to Marshall, and Marshall applied the inoculation test as before, with the same result, not only in those cases in which he had been using lymph supplied from Jenner, but also in those cases in which he had used lymph



which had been obtained from the country?—Jenner also used some stocks of equine lymph, but there were doubtful results with that.

11,680. But here is a series of cases to which the variolous test applied with complete efficacy?—If you are referring to Marshall's cases there was considerable question about them. If you follow up those cases of Marshall you will find you get entangled in a very unpleasant controversy in which it is stated that Jenner used Woodville's lymph without acknowledging it.

11,681. (*Chairman.*) What strikes me as so extraordinary is that not only in one country where, perhaps, there may be prejudices in favour of the inventor of a new system who was an inhabitant of that country, but in a number of other countries in which there were persons setting themselves to investigate they should all have thought they had discovered something which none of them had discovered, because they had neglected a very important element necessary to the inquiry?—Ballhorn and Stromeyer tested Woodville's lymph. It was sent to them as cow-pox. Even Moore afterwards charged them with blindness.

11,682. Their attention was then called to the fact that some of the lymph was variolous; yet do you say all of them shut their eyes to that afterwards?—No; then, as Brown of Musselburgh says, it became necessary to apply the test over again; and then people began to get different results from those they had previously relied on. Sometimes they produced a local vesicle upon the arm that was vaccinated, sometimes they produced specific variola—febrile symptoms and eruptions.

11,683. Still, after attention was called to this point and after repeated experiments were made, they were not led to the conclusion that the whole thing was a delusion, but they still believed in vaccination?—It is very difficult when a practice has been once set going to persuade the profession otherwise. When a new pathological theory is set going it may be as erroneous as possible, but it will have a certain time of existence.

11,684. Do you mean that while it is in the stage of doubt and inquiry medical men all over the world will accept rubbish and continue to act as though it were sense?—No, it was not a case of accepting "rubbish."

11,685. But taking what you say it was rubbish or moonshine?—It was not a question of their being misled by "rubbish," but of the profession being deceived by a subtle fallacy; and a good many years have elapsed before the true meaning and effect of Woodville's experiments have been appreciated. The leaders of the profession went to the Small-pox Hospital to see Woodville's experiments and, mistaking small-pox for cow-pox, they definitely pronounced cow-pox to be protective against small-pox.

11,686. After their attention was called to this possible source of error they tried it again with that in view?—Yes.

11,687. And they still adhered to the view that vaccination was a protection; if they did that, knowing the nature, as you say, of the lymph, they must consequently have been deceiving?—Not necessarily; it is very difficult indeed to get at the bottom of all medical beliefs; some went so far as to say, supposing it does not protect against inoculated small-pox, that does not show that it does not protect against the natural disease!

11,688. (*Sir James Paget.*) Would you express it as your view that no one was safe from inoculated small-pox who had not been inoculated with Woodville's lymph or something derived from it?—I would, after a short length of time, as Brown said.

11,689. (*Chairman.*) Who is Brown?—Brown, of Musselburgh, was a practitioner who had adopted vaccination, and was an ardent follower of Jenner. They had an outbreak of small-pox in Musselburgh and as his vaccinated cases took small-pox he tried again, testing by small-pox inoculation.

11,690. I thought you said his vaccinated cases took small-pox?—Yes.

11,691. What he ascertained was that people who had been already inoculated with small-pox took small-pox again. I thought that we must take all these various experiments as worth little or nothing because it was Woodville's lymph that was the source of inoculation?—That applies to those cases I gave at the last sitting of the Commission in which the variolous test was applied by Woodville and others; but Woodville's was not the only lymph employed at this date.

11,692. (*Professor Michael Foster.*) What happened in the cases of inoculation with other than Woodville's lymph?—In some cases the inoculation took, in other cases there is no record of the kind of lymph which was used.

11,693. I understand you to say then that some were inoculated with other than Woodville's lymph?—Yes; but I have only been explaining the fallacy in quoting Woodville's cases as a definite proof of protection.

11,694. My point is that the belief did not arise from any quotation of Woodville's cases, but from the results of the experiments of independent practitioners?—Woodville's cases were constantly quoted from time to time; and those of the independent practitioners about the country who reported their cases, and said it was definitely shown by their cases that cow-pox protected against small-pox. These are cases to which I have given full references, and Woodville's lymph had been used.

11,695. Did I understand that all those that were published were Woodville's cases?—I cannot say that in all cases Woodville's lymph was the acknowledged source of eruptions.

11,696. (*Sir James Paget.*) Does not the whole argument turn upon the question whether they were all Woodville's cases or not? If you cannot prove that the whole of those who had been protected from small-pox had been vaccinated with Woodville's lymph, what does it amount to?—You cannot prove it in every instance. I am only pointing out the fallacies under which the doctrine of protection was accepted. Even Jenner changed his opinion, and gave out that inoculation was not a fair test.

11,697. (*Professor Michael Foster.*) Did Jenner say it was not a fair test? What Jenner said was that the natural disease was the real test?—Yes, and that inoculation was not a fair test.

11,698. (*Sir James Paget.*) Suppose Jenner to have been in error, does it necessarily follow that everybody was in error who used vaccine matter and afterwards inoculated small-pox?—But we do not know that they did use vaccine properly so-called.

11,699. (*Chairman.*) They thought they did. Dr. Creighton told us of men of eminence and experience, skilled investigators, who, you are indicating, neglected the most elementary inquiry?—In some cases I have been unable to find the source of the lymph, in some cases it is definitely stated to be Woodville's.

11,700. (*Mr. Picton.*) Is there any evidence that any particular disease, other than vaccinia or that a mere injury to the skin, would prevent the action of inoculation?—Certainly.

11,701. (*Chairman.*) We cannot accept, when it supports a particular view, everything that Jenner says, and then reject everything Jenner says which does not support that view?—I prefer to accept his facts, but I do not agree always with his conclusions.

11,702. (*Dr. Collins.*) Jenner rejected Woodville's cases as not being cases of cow-pox?—Yes, he called them cases of small-pox.

11,703. (*Sir James Paget.*) And he was right, you would say?—Jenner's conclusion in that instance was right, no doubt; the facts spoke for themselves.

Adjourned till Wednesday next at one o'clock.



## Forty-eighth Day.

Wednesday, 19th November 1890.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Mr. CHARLES BRADLAUGH, M.P.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.  
Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary*.

Professor EDGAR MARCH CROOKSHANK, M.B., further examined.

*Prof. E. M.  
Crookshank,  
M.B.*

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11,704. (*Chairman*.) When we broke off last week you were giving evidence on the point of the variolous test. I do not know whether you had said all that you had intended to say upon it?—No. But I should like first to clear up one or two points which were entered into at the last sitting of the Commission. The first is with regard to your Lordship's question, Question 11,621. Your Lordship there drew attention to the importance of having some re-vaccinations to compare with those which have been given by M. Layet. In the second volume of my book I have given a paper by Estlin, in which, at page 339, he gives a statement made by Dr. Neumann, a German physician, in one of the numbers of the Belgian Encyclographie des Sciences Médicales, showing the results of 685 re-vaccinations. Neumann came to the conclusion, that those most liable to be attacked with small-pox after cow-pox were children who had been vaccinated but a few years. And I find that there is a great deal more of contemporary evidence with regard to this question of the re-vaccination of children, and I will translate a passage from M. Layet's work, "Traité pratique de la Vaccination Animale," page 277.

11,705. (*Sir James Paget*.) When was that work published?—This work was published last year. I may say that this quotation of his also answers, to a certain extent, several interesting criticisms which his Lordship made with regard to those tables of re-vaccination which are referred to in Questions 11,628, 11,634, and 11,644. M. Layet says: "The commencement of the school age, six years, marks the period of life when the first re-vaccination should take place. We have indicated in a former publication the remarkable results at which we arrived at Bordeaux. The results which have been attained elsewhere vary; but no statistics, as far as we know, deal with such large numbers as those we have been able to reach in five years, which is, indeed, 18,000 scholars. Moreover, it is not to be doubted that the more the series vary in numbers the more difference we should see in the results obtained. Thus, e.g., in 1880, of 1,400 children re-vaccinated in Paris by M. Toledano, the successes were 58 per cent. In 1888 the same vaccinator inoculated directly from the teat to the arm 300 children of the communal schools of the 7th arrondissement of Paris, and he obtained 24 per cent. successes with the boys and 32 per cent. with the girls, the average being 29 per cent."

11,706. (*Chairman*.) That differed very much from the other case, the one being 58 per cent. and the other 29 per cent. Does M. Layet suggest any explanation of the discrepancy?—Yes, he does.

11,707. (*Dr. Collins*.) With respect to the latter series, they were direct inoculation from the teat to the arm?—Yes, they were.

11,708. Was that so in the former series?—In some of them, not in all. He points to several reasons why there are different degrees of re-vaccinal success. He says the results vary according to the different stock of lymph in use, whether humanised lymph or lymph direct from the calf, and also that according to the season of

the year you will get different results. My extract proceeds: "In 1887 in the schools of the 5th arrondissement in 1,391 children of 7 to 13 years re-vaccinated, M. Lecoconnier had 37.43 per cent. successes. M. Jablonski at Poitiers obtained only 18 per cent. of successes in scholars under 12 years. In 1886, M. Besnier in 225 children of 7 to 11 years had 23 per cent. successes, and in 183 children of 11 to 14 years 26 per cent. According to M. Mangenot 35 to 45 per cent. succeeded in the schools of Lyons, and he himself in Alsace-Lorraine had 40 to 45 per cent., and at Paris in 1888 an average of 38 to 40 per cent. At Nice M. Claude re-vaccinated at the time of an epidemic of small-pox 3,388 children in the schools of the town and had 25 per cent. of complete successes with the boys, and 20 per cent. partial ones, and with the girls 35 per cent. complete successes and 18 per cent. partial ones." That was published in the report of the Municipal Council of Nice, 1887. "These last results it will be seen do not differ from ours. It is worth remarking that there are a larger proportion of successes at the same periods of school age amongst the girls than amongst the boys." (The point your Lordship drew attention to.) "We established this difference in our first statistics in 1884 and 1885. We now consider that this is because, in the first place, little girls keep quieter, and secondly, that they are less subject, by the character of their dress, to accidentally wipe the place vaccinated immediately after the operation. In fact, with boys, one is obliged to completely push up the sleeve of the shirt, and many allow it to fall back after the operation; with little girls it is enough to unfasten the bodice of the dress and expose the shoulder by pushing down the sleeve. Thus, as we have established, re-vaccination in schools ought to take place every year in the case of new scholars and of those who were not successfully re-vaccinated the previous year."

11,709. (*Chairman*.) The proportion of successes was greater in that instance in the case of the girls than of the boys?—The proportion of successes was greater in the case of the girls than of the boys.

11,710. But I suppose the same reason would not apply to the original vaccination, would it? If they were vaccinated in infancy there would not be likely to be any difference between the conduct or action of the boy or girl?—I hardly think that in the case of infants in arms there would be the same distinction between boys and girls.

11,711. He would limit that distinction to the case of vaccination at later years?—Yes, no doubt. I may say that in his official report to the mayoralty of Bordeaux he gives the other reasons which I have already given, for those differences.

11,712. (*Professor Michael Foster*.) Do you know how those results compare with Dr. Cory's results?—I have not compared them.

11,713. Dr. Cory has considerable experience in re-vaccination, has he not?—Yes.



11,714. Do you know how they compare with the German results?—Only with those that I have quoted, namely, Pfeiffer's.

11,715. All your facts are confined to France?—Those that I have read to-day are confined to France; and they are extracted from Layet; but those that I quoted previously are the results of German authorities.

11,716. (*Sir James Paget.*) Have you found any evidence that successful re-vaccination indicates a greater susceptibility to small-pox?—I have not found evidence of that; but the authorities all take the view that it indicates susceptibility to small-pox.

11,717. You are no doubt aware that Dr. Seaton in his work says that there is no evidence that the fact of re-vaccination being successful would imply a greater susceptibility to small-pox?—That seems incompatible with Seaton's belief that cow-pox is modified small-pox; if cow-pox will not protect against modified small-pox it will not protect against the more virulent form.

11,718. (*Dr. Collins.*) I suppose in instituting any comparison between the re-vaccinations you have quoted in France and those performed in this country, it would have to be borne in mind that it is exceedingly rare that re-vaccination is practised on any large scale in this country, on persons under the age of 15 or 12?—I understand so.

11,719. Do I understand from you that M. Layet's re-vaccinations at from six to seven years gave as high a per-centage of successes as at any subsequent ages?—They vary; in his 1888 re-vaccinations of children at that age he gets 50 per cent.

11,720. (*Sir James Paget.*) Did you not quote some of his figures for recruits in the army, at a much later age?—Yes, much later.

11,721. And they gave a much larger proportion of successful re-vaccinations, did they not?—Yes; but Dr. Collins, I take it, was speaking of children.

11,722. (*Dr. Bristowe.*) With regard to an answer of yours to Sir James Paget recently, do not you consider that there is a great difference between the mere production of a local pustule and the introduction of a constitutional disease. Does it necessarily follow that because by the inoculation of small-pox you produce a local result you thereby produce a constitutional effect?—I think you can distinguish between the two.

11,723. I ask the question: Do you agree that there is a difference between the two?—I think you may produce the local pustule without inducing the constitutional disease. I think that is clearly pointed out in some of the inoculation experiments.

11,724. (*Dr. Collins.*) There seems to be one point which would render these contemporary experiments in France more valuable, if it were stated, that is to say, whether in these "successes" the *fausse vaccine* is included or excluded?—The *fausse vaccine* is excluded from the successes. There is also another point which I came across in one of M. Layet's reports, in which, in speaking of these re-vaccinations, he speaks of the children as having been successfully vaccinated; so that he must have satisfied himself of that fact.

11,725. (*Chairman.*) Does he say anything which would throw light upon the reasons which led to only a portion of the children being re-vaccinated?—I had intended to point out that he also gives tables of the primary vaccination of the school children; so that I have no doubt he divided the children into two groups, those who had been vaccinated, as in the table which I handed in, and those who had not been vaccinated—of these he gives the per-centage success.

11,726. (*Dr. Collins.*) I suppose that the fact that the number of the re-vaccinated did not equal the total number of the children might be owing to the circumstance that the scholars had not all reached the re-vaccinable age, might it not?—Hardly, because I think the scholars must all be six years old before they enter.

With regard to Question 11,677, I referred to Stevenson's cases, which were put to the variolous test. I have written out an account of those cases, and I should like to hand it in for publication. Those were cases in which, at that early period, the variolous test was tried, showing that the results were not always obtained of no small-pox following. There is a complete account of the vaccination, so that anyone can judge of the character of the vaccination, and an account of the subsequent inoculation with small-pox. (*The paper was handed in. See Appendix I., page 409.*)

11,727. (*Sir James Paget.*) What was the total number of cases?—Two cases.

11,728. Do you set those two cases against the very much larger number which were recorded by others, as by Willan, for example?—I only say that in some cases in which we cannot clearly trace the origin of the lymph, we get results different from those of Woodville's.

11,729. But the question is not confined to Woodville's cases alone; you are surely aware that Willan collected and published a very large number of cases of inoculation at various times after vaccination, and proved that the inoculations were not successful?—But he does not give you a history of the lymph; he does not tell you that those were not cases inoculated with Woodville's lymph. I want to refer again to the question of the variolous test, and if I might just finish these annotations, I will return to it, and deal fully with that question. Then there is another question which I should like to draw attention to; it is Question 11,684. I think, possibly, if your Lordship will allow me to say so, that your questions might be misinterpreted by any future critics of this evidence. Your question, Question 11,685, is: "But taking what you say it was rubbish or 'moonshine.'" If you will allow me, with all deference I wish to point out with regard to that question, that while I may look upon such terms as perfectly justifiable from the lips of laymen, yet inasmuch as your question indicated that I said it was "rubbish" or "moonshine," I would beg to be allowed to say that I am anxious to give my evidence as a scientific pathologist; therefore I cannot endorse those expressions. I wish to emphasize that, particularly as I do not look upon this as a question of "rubbish or moonshine;" but I consider, as I stated in my evidence, that the profession in London (especially when they endorsed the protective power of cow-pox) was mistaken or misled by a very subtle fallacy—the fallacy in Woodville's experiments. And we may say that it has taken nearly 100 years before we have fully appreciated the effect upon the medical mind. I shall deal with that in a few moments; naturally I would not say a word against my own profession; and I cannot look upon it that they were deceived by what was obviously a fallacy; it was a very subtle fallacy indeed, and I doubt, even at the present day, if similar conditions existed, whether some of our ablest men would not also be deceived.

Then I was asked whether there was any evidence as to particular diseases being liable to prevent the action of inoculation. I said, certainly. I had in my mind a passage which I remembered from Dr. De Haën, quoted by Sanders in his account of small-pox inoculation. De Haën, speaking of the perils of inoculation, says: "The operation was prohibited in 'winter and in summer, those affected with worms, 'the nervous, irritable, rickety were exempted, and 'no one was to be inoculated during the prevalence of 'epidemic distempers, as inflammatory and putrid 'fevers; asthma, consumption, hectic or slow fever of 'any kind, internal ulcers, obstructed glands, obstructions of the viscera from fevers, scrofula, scurvy, 'itch, eruptions, local inflammations or pains of any 'kind, debility, suppressed or irregular menstruation, 'chlorosis, jaundice, pregnancy, lues venerea, whether 'in the parent or transmitted to the child, and a constitution under the strong influence of mercury prevented the operation.'" [Sanders, Comprehensive View of the Small-pox, page 82.]

11,730. (*Dr. Bristowe.*) What evidence does he give in favour of that statement; it is merely his opinion apparently?—It is from his own experience, I presume; there must be some ground for it.

11,731. (*Sir James Paget.*) Does he say that he has ever tested it in all those cases?—I simply give you his statement as it stands.

11,732. (*Professor Michael Foster.*) Do you know Bryce's statements about that?—I do not recollect them at the moment.

11,733. That sometimes such a disease as herpes would seem to prevent the development of the vaccine?—Yes. I have already given the evidence of Willan, that such diseases did sometimes interfere with variolous inoculations.

11,734. (*Dr. Bristowe.*) I asked you before the question whether these things might not interfere with the local manifestation, but whether it necessarily followed that on that account they prevented the general infection of the system?—You asked me that question. I



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only put it forward as a possible fallacy, not as an explanation in all cases.

11,735. (*Chairman.*) With regard to those two cases of Stevenson's, do you suggest that the lymph with which they were inoculated or vaccinated in the first instance was Woodville's or cow-pox lymph?—I merely throw out as a suggestion, that, judging by the results, it was not Woodville's lymph.

11,736. Why?—Because in Woodville's cases when they were tested with small-pox none of them took; whereas in these cases the inoculation did take.

11,737. But there are cases in which even a previous attack of small-pox or previous inoculation of small-pox is not a protection. According to your view may not these two have been such cases?—It would have been strange for two such cases to have occurred together. But these are not the only cases. I put these in because they are reported in full.

11,738. But if you are assuming that where you find the subsequent variolous test produces no definite results it must be because the lymph was Woodville's, and therefore small-pox, and that where the variolous test produces positive results it was true vaccine matter, and not Woodville's, is not that rather arguing in a circle?—I do not like to give up the idea of Woodville's lymph being protective. I believe it was protective, therefore I merely incline to the belief that Stevenson's lymph was not Woodville's.

11,739. But do not you think that this lymph which you think was not Woodville's produced those symptoms in excess of the local pustule which you rely upon in other cases as showing that the lymph was small-pox lymph and not vaccine lymph?—No; I do not think there is any history of variolous eruptions in those cases.

11,740. Let me read you this: "On the ninth day a few red eruptions appeared, scattered thinly over the body like measles, which in the space of four days turned brown"?—That would be quite distinct from Woodville's variolous pustules; an eruption like measles very often does follow vaccinia.

11,741. (*Dr. Bristowe.*) Is not that a characteristic sign of small-pox too?—Yes; but there were no variolous pustules in that case.

11,742. It looks rather suspicious of small-pox?—Possibly.

11,743. (*Chairman.*) I rather understood that the existence of a general eruption as distinguished from the local pustule was one of the points relied upon in some of the recorded cases to show that although the operator thought he was vaccinating he was really inoculating small-pox?—It depends upon the character of the eruption. I would not compare a measly eruption with one with from five to eighteen hundred variolous pustules. What marked Woodville's lymph as being small-pox lymph, was that there were pustules which, as Willan says, could not be distinguished from variolous pustules.

11,744. (*Dr. Bristowe.*) Still you know that one of the earlier phenomena of small-pox is the appearance of an eruption like that of measles?—That is so. On the other hand, the argument against its being variola is that when the patients after being "vaccinated" with Woodville's lymph were subsequently inoculated, the inoculation did not take, whereas in these cases it did.

11,745. (*Professor Michael Foster.*) But you have no positive evidence with regard to these cases that it was not Woodville's lymph, you simply infer that it was not, because there was no general eruption of pustules?—And also because the variolous test failed.

11,746. (*Dr. Bristowe.*) Do those cases show anything that is worth putting on record?—I think so, taken in conjunction with others. It is not as if they were the only two cases.

11,747. (*Sir James Paget.*) What number of cases do you think you could adduce of small-pox induced by inoculation a short time after vaccination?—A considerable number might be collected; and I will draw attention to some; but that has not been the course of my inquiry at all. I would like to direct the attention of the Commission to certain facts I have come across in my reading. I have not gone out of my way to collect cases, but I think I can answer that question when directing attention to the subject of the variolous test. From some of the questions put to me by the Commission I do not think the position of affairs

is yet fully appreciated. I want again to direct attention to the fact that Jenner inoculated one case with cow-pox; he also described a few cases of casual cow-pox in milkers; and then he published his paper. What I want to direct the attention of the Commission to is this, that after Mr. Cline's case in London, the lymph was lost, there was absolutely no lymph, current in the country, for the profession to test Jenner's speculations with. It is not as if Jenner had put several strains of lymph into circulation and Woodville's cases were going on simultaneously, but there was no lymph at all available. To illustrate this, it would be just like Koch's anti-tuberculous treatment, which we are all of us immensely interested in, and anxious to see tested. Supposing Koch's "lymph" were lost and there were no means of getting it, that would exactly indicate the position of affairs with regard to Jenner. Jenner published his book, the lymph was lost, and there was no means of testing his statements.

11,748. (*Chairman.*) Did not Jenner come up to London and get some of the lymph, not from patients who had been dealt with at the Hospital, but from a cow?—Yes, but that was afterwards. What I want to show now is that there was no lymph for some months; and then Woodville determined to investigate this subject. A case of cow-pox was reported to him (I have told the Commission how the lymph became contaminated) and then Jenner's nephew, George, wrote to Jenner to come to London, saying that if he did not come, Woodville and Pearson would be the chief people in this business; he explained how they were going to work it themselves. Woodville did not at first even send any lymph to Jenner; all he sent was a statement that Veterinary Surgeon Tanner thought the lymph was correct, and from this Jenner thought that it was true, and not "spurious" cow-pox. In my book I have given a full account of the extraordinary energy of Woodville and Pearson. In a very short time Pearson had published his book, and sent lymph on threads to 200 different practitioners, and begging them afterwards to try the variolous test.

11,749. Where did he get the lymph from?—That was the Pearson-Woodville lymph.

11,750. Was it got direct from the cow, or was it all lymph taken from persons who had been previously vaccinated?—There were a few cases in his private practice, I think, which were from another source; but the lymph sent out from the Small-pox Hospital was obtained from the patients who had been inoculated there.

11,751. (*Sir James Paget.*) Did not they have a distinct source of lymph at that time, from a dairy near the Gray's Inn Road?—Yes, Pearson found one distinct source, and he used it also at the Small-pox Hospital.

11,752. (*Chairman.*) He may have used it at the Small-pox Hospital, but is there anything to show that what he sent out to other people had first passed through the Small-pox Hospital?—Yes, because he sends it out with a letter from the Small-pox Hospital.

11,753. He may have sent it out with a letter from the Small-pox Hospital, because he was living there; but it does not follow from that that it was taken from a patient in the Small-pox Hospital, and was not lymph taken from the cow?—I think so, because there is no evidence of Woodville or Pearson having charged a number of lancets from the cow. Woodville says he took the matter on a lancet and used the lymph at the Hospital. Threads were then infected from the inoculated patients.

11,754. But while having used it, is there any evidence that that one taken from the cow is the source of all the lymph that he sent out?—I take it that there is.

11,755. (*Professor Michael Foster.*) There is no evidence of any other application from the cows having been made, except that primary one; it would soon pass the period at which the vaccine matter could be taken, it would grow too old; there is no evidence of either Pearson or Woodville having recourse to the cow in the Gray's Inn Road dairy after the first application?—No; they vaccinated children, and from those children they inoculated others, and then from those they sent out the lymph to a number of practitioners.

11,756. (*Dr. Bristowe.*) You are assuming that. You said just now that Woodville had not distributed any lymph from the cows directly. You have no evidence to prove that he did not, have you?—He did not send out lymph from the cow. Woodville took virus from the cow upon a lancet, started a series of "vaccina-



"tions," and practitioners were supplied with infected threads.

11,757. (*Dr. Collins.*) Amongst the only seven patients inoculated from the Gray's Inn cow direct, by Woodville, is it not the fact that four of them had pustules upon different parts of the body?—Yes. I have pointed out that there is a probability that the lymph was taken from the cow upon a variolous lancet. Then I would point out that some of those practitioners fell in with Pearson and Woodville's suggestion to report upon the lymph. They reported their results, and some also reported the results of inoculation of small-pox after the supposed cow-pox lymph.

11,758. (*Professor Michael Foster.*) Do I understand you to conclude that because those first cases of Woodville's, the two Paynes, and others had pustules, that is evidence that the lancet with which Woodville took the vaccine from the cow was contaminated with variola?—It is one explanation. But the patients may have caught the small-pox in the Hospital.

11,759. Was it not also the fact that at the first Woodville inoculated with variola almost immediately after he vaccinated?—Yes. I am only giving the variolous lancet as one explanation of the manner in which the lymph was contaminated.

11,760. There are two other hypotheses: that these patients were living in the Small-pox Hospital, which was impregnated with contagion; and the other fact, that in many cases Woodville inoculated the day after they were vaccinated?—Yes; but that is really a side issue. The point which I am upon is that the lymph was contaminated by variola; I am not interested in how it became contaminated. The evidence that it was contaminated by variola is this, that it produced, according to the practitioners who recorded the cases, variolous pustules; and that in some of them the disease was infectious.

11,761. (*Chairman.*) May I take it that in all the cases in which it did not produce variolous pustules, and was not infectious, it may be taken to be true vaccine matter uncontaminated?—No, that is a point I have already dealt with; in many of those cases in which there was only the local vesicle, when inoculations were made from those cases, pustules re-appeared.

11,762. (*Mr. Bradlaugh.*) I see on page 149 of your second volume that Woodville says that the matter he sent to Jenner was taken "from the patients then under my care"?—That was so.

11,763. (*Professor Michael Foster.*) Supposing that the occurrence of the pustules was due to the patients having taken small-pox while they were in the Hospital, it was quite possible, is it not, that the patient might have had true vaccine on the arm, and true variola in pustules over the body?—But that could not have been the case because in the country the same lymph was used with the same results although there was no exposure to small-pox.

11,764. It could not have been the case if the introduction of the variola had been, through the lancet, which brought the lymph in the first instance from the cow, because then the variolation would have been in the spot upon the arm where the vaccination was performed?—I think really that is all a side issue. The point not sufficiently appreciated at the last sitting of the Commission was that Jenner had no lymph in circulation, and that there was a dead stop in the progress of vaccination until Woodville appeared upon the scene. He then carried on his vaccinations which, whatever may be the explanation, were variolous, and, further, those eruptions were not necessarily caught from the small-pox in the Hospital, because the same lymph used by the practitioners in the country was followed by the same results as in the Small-pox Hospital in London.

11,765. (*Chairman.*) Was that so; was not it often not followed by the same result as in the Small-pox Hospital?—I think that the majority of the cases reported with results of testing were with eruptions.

11,766. (*Sir James Paget.*) Was not it the fact that they were reported because they were rare?—There is no evidence of that at all.

11,767. They reported single cases of eruptions following vaccination, but they did not report ordinary cases?—I take it that the report of cases was in answer to Pearson's request.

11,768. (*Chairman.*) Here is what Woodville says: "It appears, therefore, that out of about 500 cases of the inoculated cow-pox, one proved fatal, and the pre-

ceding table shows that in some others the disease, from the number of the pustules, was of formidable severity; while, on the other hand, a very large portion of the patients were scarcely disordered from the inoculation, and had no pustules." Supposing that to be accurate, that would represent the reverse of the phenomena, would it not, which had been found in cases of variolous inoculations, because then the rule was to have them?—Yes.

11,768a. (*Dr. Collins.*) I think the majority had them in these cases?—Yes.

11,769. (*Chairman.*) Woodville goes on to say: "Were I enabled to state a number of cases of variolous inoculation, equal to those given above, and reduced to a similar tabular form, the comparative magnitude of the two diseases might be estimated with tolerable precision. It is evident, however, that the matter of the vaccine disease has generally produced much fever pustules, and less indisposition, than that of the small-pox." And this is evident, even taking into account all these questions as to whether small-pox contamination was possible or likely, that there was a great contrast between the results of this inoculation and small-pox inoculation?—I do not deny that there was a difference in the results, but the point I am pressing is that whether there were differences in the results or not they were variolous inoculations. The point I am further pressing is that these cases, performed with such extraordinary haste, and such extraordinary energy, amounting to nearly 2,000 cases in a very short time, were those to which the attention of the profession was drawn as a proof of the anti-variolous power of cow-pox.

11,770. I want to follow that out. You say they were variolous, do you suggest that that variolous infection was the result of a disease communicated from the cow, that the cow was suffering from small-pox, the lymph of which was used for the purpose of those inoculations?—No, not at all.

11,771. That the variolous character had nothing to do with the cow?—It had nothing to do with the cow.

11,772. That it resulted altogether from circumstances in the Small-pox Hospital?—Yes.

11,773. If so, if the small-pox resulted from circumstances which would apply to all cases in the Hospital, why should there be such a marked difference between those who had been inoculated from the cow and those who had not? As a matter of fact Woodville may be right, or he may be wrong, but he says, taking those who had been first treated in the Hospital with the lymph from the cow and those who were not so treated, the first exhibited fewer pustules than the others. If you are correct in your view that the cow inoculation was not small-pox, and had nothing to do with it, then it was a mere accident?—No, I should expect a distinction between ordinary variolous inoculation and Woodville's cases.

11,774. Why?—Because they were arm-to-arm inoculations.

11,775. Did he not follow arm-to-arm in ordinary inoculations?—We have no evidence of that.

11,776. Have we evidence to the contrary?—Yes, Adams, who was working side by side with Woodville, published his arm-to-arm results as curious attenuations, and he would not have done that if Woodville previously had had similar experiences. However, the point is, that Woodville's cases had variolous pustules; that was acknowledged by the profession afterwards, especially by such men as Willan.

11,777. (*Professor Michael Foster.*) By "variolous pustules" you mean pustules on the body?—Yes. And it was when those cases were inoculated that the leaders of the profession in London went to the Small-pox Hospital, and this was pointed out as evidence of protection afforded by cow-pox. They were misled, not by "rubbish or moonshine" but by a very subtle fallacy. It was some years afterwards that Woodville admitted that they were not cases of pure cow-pox, but that they were vitiated by small-pox; that is the point, that the test was vitiated. Pearson, in his own letters to practitioners, wrote to this effect: "We have inoculated a great number of cases, 200; they have had the variolous test applied and have resisted it." That was the evidence upon which the profession accepted a belief in the protective power of cow-pox.

11,778. (*Sir James Paget.*) Has not that variolous test been applied in many cases since, and in all cases with the same result?—No, not with lymph of known ancestry. I do not think you can point out to me a definite



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set of cases inoculated with a lymph whose ancestry is known, and inoculated with variola, two or three years afterwards.

11,779. That is to say, that all the children inoculated up to 1805 or 1806 in England were inoculated with Woodville's small-pox lymph?—No, because, for example, horse-pox was one of the stocks in use. If I had been allowed to proceed with my statement I think I should have answered both those questions before they arose. I have already referred to some of Jenner's variolous tests after cow-pox, and now I will show that the results were not without doubt when he inoculated *six months* after the vaccination; then he produced specific variola.

11,780. (*Professor Michael Foster.*) Which case are you referring to?—I am referring to the case of James. I am quoting from my first volume, page 154. Here, for instance, is a case in which Jenner had different results. He inoculated James "with fresh small-pox matter, and at the same time exposed her to the effluvia of a patient. The appearances of the arm were just the same as if she never had had either small-pox or cow-pox; and on the eighth day, I expected, from the appearances, she would be ill. She was a little hotter than usual during the night, but slept well, and it was supposed that a rash appeared for the space of a few hours about the wrists. I inserted matter from her arm into two other subjects, a boy, and a woman of fifty. The boy had about half-a-dozen pustules, two or three of which were fairly characterised."

11,781. (*Dr. Bristowe.*) That is to say, he inoculated her with the small-pox and from the inoculation pustule he inoculated two others?—Yes. "Their appearance was preceded by a pretty general rash. The woman, though she felt an indisposition, had not a single pustule. A person near sixty years of age, who had in the early period of her life been exposed to the contagion of the small-pox and resisted it, fully exposed herself now to this infection. She sickened in consequence, and had three pustules, one of which became a perfect small-pox pustule. It would be unfair to draw positive conclusions from such scanty precedents, but yet they lead one to hope that a mild variety of the small-pox might thus be actually created." So that we get very different results six months after cow-pox to those obtained three weeks after cow-pox. Mary James had been inoculated with cow-pox with success. It is a very different result, a vesicle and eruptions from which small-pox was conveyed, to the results in his previous cases, in which Jenner says there was not the least effect upon the arm or the constitution.

11,782. (*Chairman.*) I wish to call your attention to this statement of Jenner's in "A continuation of facts and observations relative to the variolæ vaccinæ, or cow-pox," page 251 of your second volume. He says that Dr. Woodville "took an early opportunity of instituting an inquiry into the nature of the cow-pox. This inquiry was begun in the early part of the present year, and in May Dr. Woodville published the result, which differs essentially from mine in a point of much importance." But in an earlier passage (this was published very soon after Woodville commenced his experiments) he says: "Upwards of six thousand persons have now been inoculated with the virus of cow-pox, and the far greater part of them have since been inoculated with that of small-pox, and exposed to its infection in every rational way that could be devised, without effect." Those 6,000 persons you do not suggest were inoculated with Woodville's lymph, do you?—Yes, I do, though a few may have been "vaccinated" with Jenner's stock of equine lymph.

11,783. This was written in the same year as Woodville's experiments, because he says, "This inquiry was begun in the early part of the present year, and in May Dr. Woodville published the result;" and if you look at the report you will find that he got the lymph from the cow in January, and published his experiences in May 1799. So that what Jenner is referring to later in the year 1799 is Woodville's experiments between January and May of that year, and yet you find in a paper written in 1799, before he speaks of Woodville's experiments at all, the assertion that, "Upwards of 6,000 persons have now been inoculated with the virus of cow-pox, and the far greater part of them have since been inoculated with that of small-pox, and exposed to its infection in every rational way that could be devised, without effect." You do

not suggest, do you, that those were cases of inoculation with Woodville lymph?—Yes; at any rate the majority. There was no lymph in currency before Woodville's cases. That is the point I want to impress upon the mind of the Commission, that in a very short time Woodville had inoculated 2,000 patients himself, and had sent the lymph out to 200 practitioners.

11,784. (*Sir James Paget.*) But there is other lymph, which was not Woodville's, from which you find the same result. In Willan's results he mentions more than 100 children inoculated two or more years after vaccination, none of whom had small-pox; but it seems that some of them had a pustule at the place of inoculation, just as some of those had who were inoculated after having had small-pox, and in both cases also the matter from the pustule would produce small-pox in those who had not previously had it. The point he insisted on was that inoculation after vaccination produced only the same effect as it did after an attack of small-pox, or previous inoculation with small-pox?—But Willan's explanation was at variance with the statement of other small-pox inoculators.

11,785. I want to keep to the fact that they had the single local pustule, just as a child had who had been previously inoculated or who had previously had small-pox?—But he does not support his statement by cases to show that variolous inoculation after small-pox always produced those results. He refers to nurses, I think, having had pustules, who had previously had small-pox, and exceptional cases of variolation.

11,786. He says that after having been inoculated they were some time afterwards inoculated again, and that they had a local pustule, from which small-pox could be again conveyed. Then he mentions another case of about 50 children at the Small-pox Hospital inoculated some years after vaccination. Then he says: "I have myself seen the test of variolous inoculation applied to 180 other persons;" that is, other than the 50 just previously mentioned as unsuccessfully inoculated some years after vaccination. These other persons had been vaccinated at different times by experienced persons. The greatest effect that was produced, a vesicle and two small papules near it, was in a girl vaccinated three years and two months before. In another case a small pustule was produced on the arm of a child who had been vaccinated one year and two months before. In other instances of variolous inoculation after vaccination the pustules at the seat of inoculation generally resembled the local pustules produced by inoculation in the arms of those who had had small-pox before?—What I have already said is that Willan does not state that that was after *cow-pox*, and he does not show it.

11,787. Are we to assume that the whole of those who were thus protected from being inoculated with small-pox had been vaccinated with Woodville's lymph or any derived from it?—You must admit its possibility; that is all I can say.

11,788. You have spoken of the cases occurring in England; a number of cases were being tested in the same manner in all other countries in Europe, it is stated with the same result; is not that so?—Not a very great number.

11,789. Surely, yes. Since that time the various supplies of cow-pox lymph they have had in France have been so tested?—You will find that a very few of them have been tested.

11,790. They have been tested with the same results, have they not?—No.

11,791. Taken with the use of vaccination since Jenner's time from the cow cases have been repeatedly tested by inoculation, and the inoculation has not produced small-pox, unless it was in that form of small-pox which is limited to a local pustule?—In some cases they have produced the local pustule, and in some they have produced a condition which it was impossible to distinguish from specific variola, and in far the greater number they have never been tested at all.

11,792. The local small-pox produced in them has been declared to be the same as the local small-pox produced in those who had been inoculated with small-pox previously, or who had had an attack of small-pox?—You must remember that Willan was trying to find an explanation for those cases, and on the other hand Brown insists that such results did not follow inoculation.

11,793. Did not the results which followed vaccination from the cow give rise to statements by Bousquet and others, to the effect that the protection



from vaccination was the same as from inoculation, but not greater?—I am not aware that Bousquet tested his lymph.

11,794. He tested his lymph, and it gave rise to the statement commonly made that the protection by vaccination is the same as that by inoculation?—No doubt the statement is commonly made; but what I cannot find is definite proof of the protection of cow-pox and horse-pox against inoculated small-pox.

11,795. (*Chairman.*) Coming back to pages 251 and 252 of your second volume, do you suggest that the 6,000 persons includes the Woodville cases. Jenner begins by saying, "Upwards of 6,000 persons have now been inoculated with the virus of cow-pox, and the far greater part of them have since been inoculated with that of small-pox, and exposed to its infection in every rational way that could be devised, without effect." Then he goes on to say that Woodville had made certain experiments in that year in which he was writing, and that three fifths of the patients he inoculated suffered from eruptions. Then he says, that differs from his experience; and then he goes on to say: "When I consider that out of the great number of cases of casual inoculation immediately from cows, which have from time to time presented themselves to my observation, and the many similar instances which have been communicated to me by medical gentlemen in this neighbourhood; when I consider too that the matter with which my inoculations were conducted in the years 1797, 98, and 99" (which includes the year in which this was written, the year in which Woodville made his experiments, and the two preceding years) "was taken from different cows"—I thought your point was, that in that year 1799 there was no cow from which it could be got except that from which Woodville got it—"and that in no instance anything like a variolous pustule appeared, I cannot feel disposed to imagine that eruptions, similar to those described by Dr. Woodville, have ever been produced by the pure, uncontaminated, cow-pock virus: on the contrary, I do suppose that those which the doctor speaks of, originated in the action of variolous matter, which crept into the constitution with the vaccine." Do you really draw from that the conclusion that the 6,000 persons he referred to included the Woodville experiments, and were chiefly composed of people who had been vaccinated with the Woodville lymph?—I do; because you have an exact account of the vaccinations which Jenner had performed up to 1798, and you have also the acknowledged fact—he himself acknowledges it—that he had no lymph with which further experiments could be made.

11,796. At what date did that take place, because he himself says he had made some experiments? When did Jenner cease to have any lymph?—I have gone into this question very carefully in my book. You will find on page 149, I say that "After his return from London, in July 1798, Jenner spent most of his time until the following February at Cheltenham and Berkeley. He had lost his stock of lymph." There is a letter from Jenner in which he refers to Cline's inoculation having failed and so his lymph was lost.

11,797. But what evidence is there that he did not get some again very soon afterwards, he may have none in August 1798, and may have it again in 1799?—Pearson wrote to him for lymph, and Jenner had none to send him.

11,798. That was at that date, but it does not prove that he had none two or three months afterwards?—He had some afterwards, but he used Woodville's.

11,799. (*Sir William Savory.*) Do you fix August as the date when Jenner's lymph wholly failed?—I think that was the date at which he lost the lymph. At page 141, of my first volume, there is Cline's letter to Jenner, where he says: "Seven days since, I inoculated three children with cow-pox matter, and I have the mortification of finding that the infection has not taken, and I fear I shall be entirely disappointed unless you can contrive to send me some fresh matter. I think it might come in a quill in a letter, or inclosed in a bit of tin-foil, by the same conveyance, or in any other way that may be more convenient." Then I proceed to say "Mr. Cline having failed to carry on the disease from the first case of vaccination in London, and Jenner also having failed in the country, the stock of lymph was lost."

11,800. (*Dr. Bristowe.*) That is only your own inference?—No, Baron says so.

11,801. (*Chairman.*) But what is there to prove that there was not another cow taken with the disease

in Gloucestershire the next week?—There is no evidence that Jenner had any lymph to send out until he went up to London and got some from Woodville and later from Clarke's cow.

11,802. (*Sir William Savory.*) You say on page 151 "Jenner succeeded in obtaining cow-pox virus from a farm at Stonehouse; and on the following day, he inoculated two of the children of his friend, Mr. Hicks of Eastington. Baron relates this to disprove an assertion, subsequently made, that the first vaccinations performed by Jenner after the publication of the Inquiry were with lymph received from Pearson"?—Yes; that is part of a very intricate controversy.

11,803. But if it is a controversy, at all events it disproves the certainty that Jenner had no lymph—it leaves it open at any rate?—He had no lymph for a time—he says so himself.

11,804. (*Dr. Bristowe.*) Where does he say it? You say that he says so, but you have not given us the reference to the place where he says it?—I shall have to refer back to the correspondence in Baron. When Pearson writes to Jenner he says, "If you will only send me matter I will make your name famous;" but he could not; he had none to send, so they had to wait until this outbreak took place in London and then vaccination was set going.

11,805. (*Sir William Savory.*) That does not show that Jenner had none for himself, although he might have had none to supply his friends with, just as in the case of Dr. Koch at the present moment?—Yes, it does, because Jenner blamed Cline for having lost the lymph; that is to say, the particular lymph that Jenner had given to him, and Dr. Koch's liquid is not self-multiplying.

11,806. (*Chairman.*) But according to page 151 of your own book he did a few days after, in November, this correspondence had taken place, succeed in obtaining cow-pox virus from a farm at Stonehouse?—Yes; that was the statement made by Baron.

11,807. Do you suggest that that was not the case?—It was very doubtful as regards Hick's children. I have endeavoured to go into the whole controversy but it is by no means certain.

11,808. The word "controversy" means that somebody asserted that he had some at the time, who asserted that?—Woodville afterwards asserted that he had sent the lymph; but I do not think the point is worth going into.

11,809. (*Sir James Paget.*) But other lymph may have been circulated?—I am giving evidence as to what Jenner actually did use, and not what he may have used. I shall show that horse-pox lymph was used, and that may have been circulated.

11,810. Is not your case this, that all the cases which resisted small-pox inoculation at that time and afterwards were derived from Woodville's lymph?—Yes; you have the overwhelming experience at the Small-pox Hospital, which convinced everybody; after that it was not necessary to inoculate; Brown distinctly says so. Then a few years afterwards when outbreaks of small-pox occurred, cases which had been vaccinated had small-pox, and then the profession said, we must try the inoculation test again; and they did try it, with very varying results indeed, results such as Brown's. He was a very conscientious practitioner at Musselburgh, and I propose to lay those results before you.

11,811. If these results did vary, is it to be assumed that all those cases in which the inoculation was not successful were vaccinated with Woodville's lymph?—A few were "vaccinated" with horse-pox and cow-pox. Woodville's lymph, however, was sent to 200 practitioners, and that would be the lymph that was most in use.

11,812. Then if you admit that some of them had been only vaccinated with cow-pox, do you admit that the effect of that cow-pox was the same as that of the Woodville lymph?—I cannot differentiate the cases; I do not know that the cow-pox cases were tested.

11,813. Then what is the point of practical interest in the matter?—The point of practical interest is that I have been endeavouring to give you definite evidence *re* the protective power of cow-pox, horse-pox, and of variola-vaccine, and more particularly to point out that what has been said, namely, that Woodville's 2,000 cases at the Small-pox Hospital (that is the chief practical point) definitely proved the protection of cow-pox against variola, was a gross fallacy.

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11,814. I gather from you now that you have not been able to decide whether the protection is greater when given by such lymph as that of Woodville, or when given by horse vaccine or by cow vaccine?—I have not been able to trace the latter; but inasmuch as I believe in the protection of small-pox against small-pox, I think it is probable that those cases in which the variolous inoculation "took" were cases either of horse-pox or cow-pox.

11,815. But you will admit, will you not, that at the present day we have no evidence in the whole course of the results of vaccination to show that there is any difference in the effects produced by variola vaccine, horse-pox, or cow-pox?—We have some evidence as to the different effects to the naked eye.

11,816. You are not aware of any difference shown at the present time between the effects produced by variola vaccine and vaccine?—There is no statistical evidence in which they are distinguished.

11,817. Then you have no evidence to show that cow-pox transmitted through children is ineffectual?—I think there is.

11,818. Where?—I have given you all Layet's experiments as to re-vaccination.

11,819. Is it better than the protection which would be afforded by small-pox or by inoculation; because one who has been inoculated will receive vaccination at a reasonable time afterwards?—I fail to see the comparison.

11,820. They will receive vaccination at a short time afterwards?—Yes; small-pox does not protect against cow-pox.

11,821. The question is whether there is any difference between them to show that ordinary vaccination is not protective?—That is going out of the terms of my evidence; but there is the evidence at the Small-pox Hospital that 80 to 96 per cent. of the patients have been vaccinated, if you are simply speaking of the question of protection.

11,822. Protection by vaccination as distinguished from the protection supposed to be derived by Woodville in the variola vaccine cases?—If I understand your question aright we have no statistics separating the different lymphs one from another. All I want to point out for instance with regard to horse-pox is, that where that has been put to the test the results have been very unsatisfactory. It was one of the questions I asked M. Layet when I heard with some surprise that horse-pox was being substituted all over France for cow-pox. I said, what evidence is there of the variolous test having been applied? Now I have gone into the evidence as to the variolous test after horse-pox, and what I would point out is that it is extremely unsatisfactory. Jenner at one time abandoned horse-pox altogether as not protective. I believe the following are the only test experiments which have ever been made with horse-pox. On page 254 of Volume I. of my book there are three cases of casual horse grease, or horse-pox as we know it to be now, in which the variolous test was applied. In the first case, Thomas Pearce, there was no effect; so apparently the variolous test was successful. In the second case there was mild small-pox, a few eruptions showing themselves upon the forehead; the third case "was assured that he never need to fear the infection of small-pox. But this assertion proved fallacious, for on being exposed to the infection upwards of 20 years afterwards he caught the disease, "which took the regular course in a very mild way." Now Jenner concluded from that that direct horse grease was not really protective; that it was not protective until it had passed through the cow. The next cases which afford some evidence bearing upon the subject you will find upon page 282; there you have two cases of horse-pox, Virgoe and Haynes. The fact that they suffered from constitutional horse-pox in spite of their having been previously inoculated successfully for small-pox is evidence tending in the direction that small-pox does not protect against horse-pox. Then the other case is the case of Summers, in the second paragraph of Case XXIII, page 23, of my second volume; that was a case of horse-pox. There the expression is: "He was therefore inoculated with variolous matter from a fresh pustule;" he was further inoculated very shortly afterwards, but all that is said is the *system* did not feel the effects of it in the smallest degree; so that we are not very well able to judge of the results. Then we have Cline's patient; that was with horse-pox. At page 140 of my first volume, it will be seen that Cline "inoculated him with small-pox matter in three places, which were slightly inflamed on the

"third day, and then subsided," which is not very conclusive. Then the next case is Tanner, who was the first to show that horse-pox could be transmitted through the cow. He was equinated; he sent his lymph to Jenner and it was used with approval. A few years afterwards he was inoculated at the Small-pox Hospital and had such an attack that Woodville told him that if he had been exposed to the infection of small-pox he would have had a very severe attack of that disease. Since that date I can find no cases which have been tested. Inasmuch as you cannot now distinguish between the cases in which horse-pox is used, you cannot tell whether it protects or not.

11,823. (*Chairman.*) I see you state on page 161 of your first volume that "Jenner had employed the Woodville lymph, and inoculated his grandnephew, Stephen Jenner, and a boy of the name of Hill, who was about four years old. With lymph from the arm of the boy Hill," who it is stated had been inoculated with the Woodville lymph, "Jenner inoculated two of the children of his friend, Mr. Hicks." Now if we turn to page 151 we find that, "According to Baron, a few days afterwards (November 26th), Jenner succeeded in obtaining cow-pox virus from a farm at Stonehouse, and on the following day, he inoculated two of the children of his friend, Mr. Hicks." Had he two friends each named Hicks, and each with two children?—No. That was the beginning of the controversy.

11,824. Baron is your authority for saying that Jenner inoculated the children of Hicks?—Yes.

11,825. What is your authority for saying that he, Jenner, inoculated the boy Hill with Woodville lymph, and from him inoculated the children of Hicks?—For the moment I do not recollect the reference; but I can vouch that that is an authorised statement.

11,826. (*Professor Michael Foster.*) Does not Jenner himself say so?—Jenner himself says that he received the lymph from Woodville, and used it upon that case. Here is a quotation from Woodville in reference to this lymph sent to Marshall, and this will give you an idea of the controversy. Woodville says: "Now it is very extraordinary, but certainly a truth, that Dr. Jenner did not ever obtain the matter from Clarke's cow till after the date of Dr. Marshall's letter, which is said to contain an account of its effects by inoculation."

11,827. (*Chairman.*) But he did get some virus direct from Clark's farm?—Yes, he did; but as to the inoculation of the children of Hicks it is very difficult to decide.

11,828. But before leaving London Jenner got some lymph. The disease must have been existing to some extent to enable him to get the lymph. Why is it to be imagined that all the lymph he got after January 1799 was got from the Small-pox Hospital if there were cows in that condition in London?—Soon after Jenner's experiments, when Woodville and Pearson were working the whole concern by themselves, Jenner went to London and got lymph at Kentish Town.

11,829. (*Professor Michael Foster.*) But surely Pearson got lymph at other dairies in London?—Yes, after Woodville.

11,830. And distributed it?—Yes.

11,831. Pearson was quite as active as Woodville, was he not, in distributing lymph?—Yes, they called it "hospital matter," and sent it out from the Small-pox Hospital.

11,832. What evidence have you that Pearson in distributing his lymph as he did, confined his lymph to the lymph he had taken in company with Woodville from the Small-pox Hospital, and did not also distribute the lymph he had taken independently of Woodville?—Because in one of his letters you will find that he draws distinction between a few cases he had in private practice and the cases inoculated with the hospital lymph.

11,833. But in speaking of the general distribution of lymph there is in one of Pearson's letters a statement to the effect that the lymph distributed by himself was partly lymph he distributed in company with Woodville and partly lymph he had got himself from dairies in London. That, I think, you will find in the "Medical and Physical Journal" in a letter by Pearson?—Yes, I remember that letter; there is no doubt that that is quite correct, that he sent lymph of that stock from the Small-pox Hospital, but it was all called Pearson-Woodville lymph, it was all called "hospital matter," and you must judge of it by its effects.

11,834. (*Sir William Savory.*) What do you say Woodville's lymph was?—It was one of two things. I am inclined to believe myself that when he inoculated



from the secondary pustules he was conveying pure small-pox. I agree with what Moore says; Moore says that "Pearson and Woodville sent small-pox all 'over the world,' that is to say, in an attenuated form. It may be that they were inoculating all through a mixture of vaccine and small-pox, but that I should think was very improbable.

11,835. What do you mean by a mixture of vaccine and small-pox; do you mean a lymph composed of those two, or sometimes of one and sometimes of the other?—Judging from those cases I think there was always small-pox present, because even when it only produced the local vesicle upon the arm, although at first sight it would seem that that must have been a case of cow-pox, yet on referring to cases inoculated from such a case with only a local vesicle we find we again get pustules cropping up.

11,836. Do you apply that test to the cases in which Jenner, having taken Woodville lymph, vaccinated with it? Your statement on page 161 of your first volume is: "Jenner had employed the Woodville lymph, and inoculated his grandnephew, Stephen Jenner, and a boy of the name of Hill, who was about four years old. With lymph from the arm of the boy Hill, Jenner inoculated two of the children of his friend, Mr. Hicks, and at the same time, 16 others, and with matter taken from this source, his nephew, Henry Jenner, successfully vaccinated a child twenty hours old, and no eruptions resulted in any. The same stock supplied Mr. Marshall with virus for inoculations on 107 persons, and in only one or two cases were there any eruptions." Do you follow those cases out to show that when the vaccinations were pursued eruptions appeared?—Yes, that statement was afterwards modified. Jenner stated first of all that they were pimples, and afterwards used the term pustules.

11,837. Where is that?—In the second volume of my book you will find afterwards that Jenner uses the word "pustules." Professor Foster asked me repeatedly on one occasion where Jenner altered his mind and called them pustules.

11,838. You have 120 cases here. Can you show that the majority of them had pustules?—Not the majority, but some.

11,839. But you say you distinguish between the variolous matter and the results in other cases?—I stated that in Adam's cases there were many cases in which there were no pustules.

11,840. But your cases show that you get them at first and do not afterwards?—For a time you may have a liability for pustules to recur.

11,841. Where is the proof that in this case it was variolous and not vaccine matter, that was furnished? According to your own test, *prima facie* it was vaccine matter and not variolous?—My belief is that it was the "hospital matter" which produced in the hands of other practitioners sometimes eruptions.

11,842. (Professor Michael Foster.) Marshall says that it certainly appears extraordinary; that is in his first letter. In his second letter he says, "In all my cases there never was but one pustule which appeared on a patient's elbow on the inoculated arm"? Those cases of Marshall's amounted to 473 ultimately?—Yes.

11,843. (Chairman.) Let me call your attention to this with regard to Marshall. Marshall's cases were between 400 and 500, of those, 127 were from matter sent from the London cow, and the rest were from cow-pox in his own county. Then he states that he has tried the variolous test in 211 of his patients, but every one resisted it; do you suggest that that was a case in which they were protected by previous small-pox, seeing that there they had nothing but vaccine taken from the London cow or the country cow?—If they were not all done with Woodville's lymph the results would point to there being a temporary antagonism.

11,844. Between what?—Between cow-pox and small-pox; those tests were applied only a few weeks afterwards. I am not stating that there is absolutely no effect after cow-pox inoculation.

11,845. I understood you to say that the belief that cow-pox matter produces any effect was a delusion?—No, I would not use that term, my views correspond very much with those of Brown, of Musselburgh. Brown's views are supported by evidence and experiments which are fairly exhaustive.

(Chairman.) But we must have the evidence by which he is guided.

11,846. (Professor Michael Foster.) But before we leave Marshall's cases you told the Commission in your evidence that those cases of Marshall's which he speaks of as vaccinated from a source in his county were in

reality, Woodville's lymph?—I said some of them, I said that was the fallacy. You quoted him.

11,847. I quoted him as evidence of lymph having other sources than Woodville's source. You said in your answer to Question 11,680, "If you are referring to Marshall's cases there was considerable question about them. If you follow up those cases of Marshall you will find you get entangled in a very unpleasant controversy in which it is stated that Jenner used Woodville's lymph without acknowledging it." Apparently, as far as I can make out, you are to a certain extent probably right, because in the paragraph you were looking for just now, which is on page 185 of your second volume, Jenner says that a thread imbrued in some of the matter generated in London was sent to him. There is the statement on the other hand by Jenner himself, that the vaccine with which he vaccinated Stephen Jenner and James Hill was subsequently used for the children of Henry Hicks, of Eastington, the place where Marshall lived; and it is probable that Marshall took his stock from those cases of Hicks; so that some of Marshall's cases we may refer back to the thread which was sent to Jenner from London. And it would appear from Woodville's statement that that thread was taken from Bumpus; because you will find in Woodville's account that he did send to Jenner a thread from Bumpus's arm, and by means of that thread Jenner himself inoculated 18 persons, which corresponds to the number here stated in Jenner's own account; and that another gentleman inoculated 140, the probability being that that was Marshall; so that Marshall was dealing apparently with two lymphs—one Woodville's, and the other the lymph taken by Tanner from the dairy in London. In his results in those cases he finds no difference whatever?—Quite so; but when you asked me the question I understood you to refer to Marshall's 107 cases. I know that you were not aware that Woodville's lymph might have been used, from the way in which you took my answer. If you are now going to bring up the 527 cases I will deal with them.

11,848. (Sir William Savory.) What do you mean by the "temporary antagonism" that you referred to just now?—I think there is evidence in these cases (I think that would harmonise the statements which have been made) to show that there is a temporary antagonism between cow-pox and small-pox.

11,849. In what way; what antagonism do you refer to?—That for a period of perhaps two or three years, small-pox, that is to say, by the test of inoculation, will not take after an attack of cow-pox.

11,850. For two or three years cow-pox will prevent small-pox?—Yes; inoculated small-pox.

11,851. (Sir James Paget.) And not for more years?—No.

11,852. (Chairman.) Your view is that there is simply a difference of opinion as to the length of time for which it operates to protect?—Looking at it impartially I think there is certainly evidence that might lead one to suppose that no effect was produced. On the other hand, there is a good deal of evidence which would lead one to believe, having a perfectly open and impartial mind upon the subject, that there may be a transient antagonism. That is the view that I take myself; and I propose to illustrate that by Brown's experiments; it is definite evidence, which I should like to lay before the Commission. Brown says, at page 197, "When I commenced the practice of vaccination, in common with most practitioners I inoculated them a few weeks or months after. This I continued to do, to the extent of 30 or 40 cases, when finding the appearances nearly similar, I desisted. In these trials the arm put on the following appearances. During the first three or four days the punctured point was elevated, and a little inflamed, and had the same appearance as if no previous vaccination had existed; from the fourth to the sixth day it still became more elevated and inflamed, but its progress less rapid than where no vaccination had taken place, and its point vesicated, but without any pustular appearance; from the sixth to the eighth, ninth, or tenth day it acquired a pretty large conical figure, a good deal inflamed, but still without any pustular form; after this period it rapidly decayed, and in a few days disappeared, without leaving any scab or scar. In some cases it only gained the appearance as described at the sixth day, and then decayed. In none of these trials were there ever the smallest appearance of a pustule, but frequently the point of the tumour presented the appearance of a small shining watery vesicle. In no case were there the smallest show of a circular inflammation or areola and no constitutional affection whatever. After these trials

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“ and the concurring testimony of other practitioners  
“ and publications on the subject I did not consider it  
“ necessary to persist any further in these inocula-  
tions, and from the year 1800 until last summer I  
“ did not renew this practice.” Immediately, however,  
after the occurrence of his cases of small-pox after  
vaccination, Brown thought it right to renew his test  
inoculations. He gives a list of the cases, and he  
found when he tested them by variolous inoculation  
three or four years, or even two years after he had  
vaccinated them, that then they had a specific variola.

He gives in his work a number of cases, and I should  
like to put them in in a tabular form.  
11,853. What is the work you are quoting from?—  
It is “An Inquiry into the anti-variolous power of  
“Vaccination,” and with all deference I would venture  
to say, that I trust every member of the Commis-  
sion will read that work by Brown, of Musselburgh.  
He was very much abused at the time; and yet there  
is hardly anything he has said in 1809 which has not  
been verified by 1890. The date of the work is 1809.  
The following are the cases tabulated:—

Brown's cases of Small-pox in Vaccinated Children (1808-1809).

Names.		Age when Vaccinated.	Age at which they caught Small-pox.	Names.		Age when Vaccinated.	Age at which they caught Small-pox.
1	- - - -	3 or 4 months	3 years.	25	B—— - -	4 months - -	3 years.
2	- - - -		6 "	26	Paterson - -	8 months - -	3 "
3	- - - -		5 "	27	M'Donald - -	1 month - -	5 "
4	- - - -		4 "	28	Owen - - -	6 months - -	7 "
5	- - - -	6 months - -	3 "	29	Owen - - -	6 months - -	6 "
6	- - - -	5 months - -	7 "	30	Owen - - -	1 year - - -	4 "
7	George L. - -	Infancy - -	7 "	31	Jardin - - -	18 months - -	7 "
8	Hugh Peacock -	3 months - -	6 "	32	Cairns - - -	2 years - - -	7 "
9	Walter Ritchie -	5 months - -	5½ "	33	Cairns - - -	1 year - - -	6 "
10	Stirling - - -	1½ years - -	9½ "	34	Robertson - -	Few months - -	7 "
11	Baux - - -	7 months - -	7 "	35	Robertson - -	Few months - -	5 "
12	Baux - - -	9 months - -	5 "	36	Robertson - -	Few months - -	3 "
13	Eal - - -	9 months - -	6 "	37	King - - -	3 months - -	7 "
14	Wood - - -	2 years 3 months -	2½ "	38	Galley - - -	6 months - -	6 "
15	M. Proudfoot -	3 months - -	7 "	39	Galley - - -	6 months - -	3 "
16	Proudfoot - -	Infancy - -	8 "	40	Caddel - - -	4 months - -	4½ "
17	E. Saffley - -	3 years - -	5½ "	41	Caddel - - -	4 months - -	2 "
18	Carse - - -	4 years - -	9 "	42	Drysdale - -	6 months - -	5 "
19	Muirhead - -	Infancy - -	About 7 "	43	Deans - - -	1 year - - -	5 "
20	Muirhead - -	Infancy - -	" 8 "	44	Hunter - - -	Infancy - -	4 "
21	Muirhead - -	Infancy - -	" 9 "	45	Hunter - - -	3 years - -	6 "
22	Kedzlie - - -	3 months - -	4 "	46	S—— - - -	5 months - -	5 "
23	Hope - - -	3 months - -	6 "	47	Wilsen - - -	6 months - -	5 "
24	B—— - - -	6 months - -	6½ "	48	D—— - - -	4 months - -	8 "

Cases tested by Small-pox Inoculation.

		Age when Vaccinated.	Age when Inoculated.	Result of Vaccination.	Scars.	Remarks.
1. A boy -	}	When a few months old.	—	Most perfect -	Large scars -	Both the inoculated arms advanced steadily and by the eighth day assumed the appearance of a moderately elevated and inflamed tumor, with a pustule upon the point, but containing little virus: from the eighth to the eleventh day the inflammation rapidly extended in circumference, and the pustule much increased in diameter, but not containing much virus. It now in every respect resembled a variolous inoculation in a state of perfection, and accordingly was followed with constitutional symptoms. The boy became sick, and continued feverish for three days, with frequent starting, and at last an eruption of about a dozen or two of inflamed spots were observed; they only remained out three days and then disappeared; there was a rash previous to the eruption. The girl's arm went through nearly the same course, but not to so great an extent; and, although sick, she had no rash nor eruption. [From the boy virus was taken for the next two cases.]
2. A girl -						
3. A child -	}	One vaccinated by Brown, the other by Bell, when a few months old.	Ages 6 and 3 respectively.	—	—	Practically same appearance, but no eruptions.
4. A child -						
5. A boy -	}	One vaccinated by Brown, when a few months old. Other vaccinated in Jamaica, two years old.	Ages 6 and 11 respectively.	Progress of vaccination regular.	Distinct scar in one. The Jamaica case regarded as "perfect."	In one pustular appearance and extreme core inflammation. In the other a high conical appearance and inflammation.
6. A boy -						
7. Two children.	}	Vaccinated by Brown when 3 months old.	Age 3 and 2 years respectively.	—	—	Same appearance, but one was not pustular in appearance.
8.						
9. Child of Mr. H.		Vaccinated by Brown when 6 months old.	6 years -	Perfect vesicle and good scar.	—	Puncture elevated and inflamed; then pustular and surrounded by an erysipelatous inflammation. Child sick and feverish, supervening pustules to the number of a dozen.
10. Children of Mr. L.	}	Both vaccinated by Stewart at 5 months.	6 and 4 years respectively.	Good vesicles -	Cicatrix distinct.	Both inoculated by Brown. Puncture on the elder was vesicular, supernumerary vesicles, beautiful areola. Child unwell. Other scabbed and healed.
11. L.						
12. Child of Mrs. H.		Vaccinated by Brown when 4 months old.	7 years -	Vaccination typical.	—	Puncture was elevated, then vesicular, then pustular, several eruptions, and severe constitutional symptoms, extremely sick, fever, headache, thirst, sufficient virus in pustule of inoculation to infect two or three lancets. Measley rash all over body. One dozen and a half distinct pustules over the body.
13. Child of Mr. M.		Vaccinated in both arms when 6 months old.	6 years -	—	Scars large and distinct.	Inoculated by the same practitioner. Result: Inoculation spot red and vesicated pustules and faint areola.



I would also direct attention to Brown of Musselburgh's work as answering your Lordship's question whether I could give any explanation as to how vaccination was accepted by the profession. Here is the evidence of a contemporary. Brown says on page 3: "No sooner did Dr. Jenner announce his discovery to the public, and its merits were examined, than every facility was given to its circulation. The rage was extreme and fashionable, not only amongst the medical profession, but all classes of society, so that in less than two years from its first introduction one of the most valuable and ancient improvements in the whole history of medicine was almost entirely neglected and given up."

11,854. Brown was a strong inoculator apparently?—No, he was not a strong inoculator.

11,855. But he uses some strong expressions?—When those cases occurred he wanted the profession to reconsider the question as to whether or not inoculation ought to be given up. He says on page 12: "I have no hesitation in confessing that I became an early convert and advocate for the new practice, and it is now eight years and a half since I have uniformly advised and practised vaccination, in which period I may safely say I have vaccinated upwards of twelve hundred, and have only had three cases of inoculation, which were at the positive request of their parents. This I persevered in until the present moment, notwithstanding I met with several instances where it appeared to fail in giving security about three years after the introduction of the practice, a few more about two years ago, and those which make a part of the present volume within the last six months." The object of his work was to induce the profession to reconsider the subject, but he does not press forward inoculation at all. He says then, that is after being eight years a vaccinator, "Within the last six months, however, in consequence of the small-pox making their appearance not only in Musselburgh, but in the whole vicinity, such a number of striking cases have been pressed upon my observation, and such a forcible appeal made to my senses, that I could no longer resist the conviction that vaccination even in the most perfect form is not only incapable of imparting permanent security against small-pox, but even of retaining the system in that state of impregnation, capable of only allowing it to exercise its influence to a safe or trifling extent." Brown, of Musselburgh, produced all these facts to support his view that cow-pox would not give a permanent protection against small-pox, and your Lordship asked me how it could be that when evidence of the failure of vaccination was given the belief could be still kept up. There is a very good illustration in the case of Brown. Brown very clearly, carefully, and conscientiously gave all the details of his cases, yet Ring, Jenner's great supporter, absolutely rejected that evidence, and said he could produce volumes of evidence to prove the permanency of the protection of cow-pox against small-pox.

11,856. I put my question in reference to your view that cow-pox was no protection against small-pox, and that it was entirely a mistake of the early observers to suppose that variolation after cow-pox uncontaminated by small-pox showed any difference as compared with variolation after neither variolation nor cow-pox. It was as to that that I put the question as to the effect of variolation; but now that I understand your position to be that genuine cow-pox uncontaminated with small-pox does afford a certain protection, though to a very limited extent, so that variolation within that limited time would show that protection, then my difficulty altogether ceases, because all the early cases of variolation were within that limited time within which, according to what I now understand to be your view, there is a protection?—Yes, that is so, and that is why if I had only had the opportunity of giving my statement continuously I should have fully explained my position.

11,857. I am bound to say that you have published two very big volumes, which I have gone through, and they did not give me a ray of light upon that point?—What I have stated in my book is that cow-pox exercises no specific protective power, and that cow-pox and small-pox are specifically distinct diseases, and I have pointed out in the variolous tests applied in a few isolated cases by Jenner and others that the operation was performed too soon after the cow-pox, and that therefore that was a fallacy. At the same time there is also evidence, which one judging impartially must admit, which supports the view that there may be an antagonism which, as Brown says, is both "temporary and feeble."

11,858. From that point of view, that there is some antagonism, so that variolation would not have the same effect as if there had been no cow-pox, what is the importance of that upon which you have so much dwelt, that the inoculations which were succeeded by the variolation experiments were with Woodville's contaminated small-pox lymph?—That was to explain how it was that the profession so readily believed in the protective power of cow-pox; it was simply a question of pathological truth.

11,859. But according to the view you now suggest, whether the prior inoculation had been with contaminated or with genuine uncontaminated cow-pox lymph, the subsequent variolation was likely to show precisely the same result if the variolation took place within the limited time you speak of. If that is so I do not understand the distinction between the two?—I do not think I have been anxious to draw any distinction, merely to lay the facts before the Commission.

11,860. (Dr. Collins.) I understand you to suggest, both in your book and in your evidence, that there is a specific distinction to be drawn between cow-pox and small-pox?—Yes.

11,861. That being so, you think it is valuable to point out that the Woodville cases which were at one time regarded as being cow-pox were truly variolous?—Yes.

11,862. Would you say that any other disease besides cow-pox, of a similar character which has local effects, has the same temporary antagonism to the variolous inoculation of the non-specific kind?—Yes; sheep-pox, for example.

11,863. (Sir James Paget.) Are there any examples of that?—Yes.

11,864. And you have said that horse-pox has a certain amount of protectiveness?—It may and it may not have. Some of the examples show that when it was tested the small-pox "took," and in some that it did not take? I should like to be very clear upon this point. I look upon it in this way, that cow-pox does not exercise any specific protective power. There is nothing analogous in vaccination to one attack of small-pox. One attack of small-pox protects from small-pox. One attack of scarlet fever protects from future attacks.

11,865. Was not it commonly believed at the beginning of vaccination that if they had collected the cases of second attacks of small-pox they would have been found as numerous as the cases of small-pox after vaccination?—Yes, at that time, because they did not know then what we do now.

11,866. Do we know now anything more about the occurrence of second attacks of small-pox?—No, but we know more about small-pox after vaccination. For instance, in the case of the outbreak, in Italy, in 1870, there were 55,897 cases of small-pox, of which cases 76 per cent. had been vaccinated. If they had had such statistics as that in the case of small-pox we should not have heard that small-pox was auto-protective.

11,867. Have the cases been recorded of second attacks of small-pox?—They have been collected at times; but supposing there were an epidemic of small-pox in this country, and in a few years afterwards there was another epidemic with 55,000 cases of small-pox, of which 76 per cent. were cases of secondary small-pox, I should conclude that small-pox did not protect against itself.

11,868. (Chairman.) I think there were a considerable number of cases of small-pox after small-pox in the Sheffield epidemic that must have been out of a very limited number?—I have gone very fully into that question.

11,869. (Dr. Bristowe.) I did not understand the distinction you were drawing just now between the specific prevention of disease and non-specific prevention?—One attack of scarlet fever protecting, for example, against a second attack; that I look upon as a specific protection.

11,870. Take the cases in which an attack of scarlet fever does not protect beyond a limited time, which are many; would you say those were cases of specific protection?—That is rather pressing the definition of the word, because such cases would be exceptions to the rule.

11,871. They would be cases of specific protection?—Yes, if there were any protection at all.

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11,872. I am assuming that there is ; we know that one attack of scarlet fever may protect only for a time, but not permanently ; one attack of small-pox may protect only for a time, but not permanently ; would you regard those as cases of specific protection ?—Yes.

11,873. What distinction then do you draw between the protection afforded by cow-pox against small-pox and these cases ; are they not equally specific in the sense of protecting from future attack ?—Admitting the possibility of a transient antagonism, then what is the rule in one case is the exception in the other.

11,874. I want to know what your definition of "specific" is ?—The protection is not specific when there is a tolerance produced by a disease specifically distinct.

11,875. That is all you mean ?—Yes, that is all I mean. I want to make my position very clear before the Commission ; it is this : that I have gone into all the possibilities of fallacy because I regard it as quite possible that evidence might be forthcoming, proving that cow-pox exercised no effect whatever against small-pox. I say it is possible. Now if there were definite reliable evidence of that, these variolous testings would have to be explained as fallacious ; but in the absence of such evidence I point out that there is evidence to show that cow-pox does exercise a temporary antagonism—possibly sheep-pox too, and cattle plague too—against an attack of small-pox, but of a very transient nature.

11,876. (*Chairman.*) Supposing it does exercise some protection, though of a more limited character than if one had been subject to the disease itself, would that not tend to show by analogy to other cases of protection that there was some relation between the disease which affords the temporary protection and the disease from which it protects ?—If it applied in all cases, yes ; but in sheep-pox you get a vesicle which is of a similar character to the vaccine vesicle, and which practically cannot be distinguished from it. With that vesicle it was claimed that there was protection against small-pox. I shall lay that before you later on. Now to follow out your Lordship's question one would have to admit that cow-pox, small-pox, and sheep-pox are all modifications of the same disease, and yet cow-pox will not protect against sheep-pox—not only are they distinct in their history, their epidemiology and their pathology, but sheep-pox and cow-pox will not protect against one another.

11,877. Do you accept the evidence that there is the same antagonism between sheep-pox and small-pox as between cow-pox and small-pox ?—There is, if we accept the evidence ; but it is not upon so large a scale. Marson, who inoculated a patient with sheep-pox, produced a vesicle which he could not distinguish from the so-called vaccine vesicle, and he carried on that lymph for several weeks ; he applied the variolous test, and he says it did not take. If true, I hold that that would be another instance of there being a transient antagonism but not a specific protection.

11,878. (*Sir James Paget.*) How soon after the inoculation with sheep-pox did he apply the variolous test ?—I think almost immediately.

11,879. (*Professor Michael Foster.*) Was that the case of which Marson speaks as not satisfying himself, because he was not convinced that the lancet was not contaminated with vaccine ?—I do not think that is putting it quite fairly. The best way I think would be to read his statement. What Marson says is this : "When small-pox appeared in this country in the sheep in 1847, we tried to communicate it, by inoculation, to the human subject, and thought we had succeeded in doing so, and the virus was carried on from one to another for several weeks in succession. The pock produced was very like cow-pox, having only, as we thought, a bluer tinge, and was protective against small-pox, as we ascertained by inoculating the patient afterwards with the lymph of human variola ; but we had unfortunately used for the original inoculation the same lancet instead of having a new one, as we ought to have had, that we had previously used for vaccinating ; and although it was, as we believe, perfectly clean and free from vaccine lymph, nevertheless, as the disease could not be produced again in the human subject, either by Mr. Ceely of Aylesbury, who made repeated trials with the lymph of sheep-pox, or by ourselves, the experiment was never brought before the profession ;" but when you take into account the very definite experiments made by Sacco, Marchelli,

Magnani, and others in Italy, the fact that certain observers failed is no evidence that previous observers did not succeed. How often they have tried to inoculate a cow with variola and failed ! Yet I think unprejudiced observers will agree that Ceely and Badcock were successful and that they did not contaminate their lancets.

11,880. There is some question about it, is there not ?—I think there is no doubt that Ceely and Badcock both succeeded, although Dr. Klein and others failed ; the fact of Klein's failure did not disprove Ceely's success.

11,881. (*Dr. Collins.*) You have told us that with reference to cattle plague and sheep-pox there may be a certain antagonism exerted against variolous poison similar to that exerted by cow-pox, could you give any evidence with regard to syphilis, because I think Staff-Surgeon Preston, in answer to Question 3361, told us that there was some such protection ?—I have not gone into that matter.

11,882. (*Chairman.*) May I ask you why you fix the limit of protection at three years ?—Partly from Brown's variolous experiments and his experiences at Musselburgh which will be put before the Commission. I do not fix it at two or three years, but taking these experiences with others as to the auto-protection of cow-pox, all I wish to say is that without binding myself, I am prepared to admit that there is evidence which leads me to conclude that there may be in some cases a temporary antagonism for even as long as two or three years.

11,883. (*Mr. Meadows White.*) Would you suggest three years as the maximum protection or would you suggest it as the average ?—As a limit, and I do so to harmonise the evidence as much as possible. I should not be surprised myself if evidence were forthcoming to show that even that is overstating it.

11,884-6. (*Professor Michael Foster.*) Does Brown state the authority for the first vaccination which he re-vaccinated with success ?—I think the case was vaccinated by himself.

11,887. You are aware that it was stated at the time that several of those cases in which he said he had successfully re-vaccinated after a previous vaccination had not been successfully vaccinated ?—That was said ; but judged by the scars—

11,888. It was more than that ; evidence was put forward with regard to some of those cases of Brown's that they could not have been proper cases of vaccination in the first instance. You have, no doubt, read the controversy between Brown and the College of Surgeons and Physicians ?—Yes.

11,889. (*Chairman.*) If you have concluded all you wished to say with reference to the variolous test, will you pass now to the question of small-pox after natural cow-pox ?—I would beg leave to pass on for the moment to the question of scars, having some drawings with me now, especially as this bears upon the question that Sir William Savory asked me as to whether the condition of the scars had been ascertained in the case of Layet's re-vaccinations. I want to point out the state of opinion in France and elsewhere with regard to the importance to be attached to the character of the scar. There are several authorities quoted by Steinbrenner and giving statistics showing that the character and the number of the marks bear no relation to immunity either from re-vaccination or small-pox. This is borne out firstly by Camper's cases. Camper tested this doctrine in the case of small-pox inoculation ; he made experiments, not very numerous—they were only twelve—to ascertain whether there were any differences according to the number of the punctures ; and I will put in his table of results. (*The paper was handed in. See Appendix I., page 409.*) For instance, in one case when he made one puncture he obtained 15 pustules ; in another case in which he made three punctures he obtained 300 pustules ; in another in which he made two punctures there were 1,000 pustules. There were only, as I say, 12 cases, but still I would put them in as bearing upon the subject. Then I would refer to the conclusions of Layet, given on pages 269 and 270 of his "Traité pratique de la Vaccination Animale" : "In 1883, when the re-vaccinations took place at Val-de-Grâce, under the direction of M. Kelsch, mention is made of the vaccinal cicatrices in the case of 1,477 of the re-vaccinated subjects. Revision of the results obtained brings out that the number of cicatrices from infantile vaccination makes no very noticeable difference in the results of the re-vaccination. The proportion of successes was nearly the



"same in the subjects presenting six or five marks and in those with only one; and even the lowest result appertained to those who had no apparent cicatrice." And Layet after all his experience of re-vaccination says: "The larger or smaller size of the mark which the vaccinal pustule leaves behind ought rather to be considered as depending on the local inflammation which takes place at the seat of inoculation than as an indication of a more thorough impregnation of the organism by the inoculated vaccine. Further, an exaggerated inflammatory process is often the result of an irritation of the tissues, which is harmful rather than favourable to the specific process of the vaccine; and, consequently, it is almost allowable to profess the opinion that very well marked cicatrices are an indication of greater receptivity to fresh inoculations; that is to say, that the larger the marks of the first vaccination the greater the chances are that the vaccine will take again; and this is in fact what Dr. Lalagade, of Albi, has recently endeavoured to prove in a memoir communicated to the Academy." He shows that you might have some statistics which would point to large marks being less protective than small ones, and also some statistics which would point to the conclusion that no marks at all are better than several; and, therefore, it is considered that this question of the character of the marks is extremely fallacious.

11,890. But how did Layet test the question of its being of importance or of no importance?—By re-vaccination.

11,891. Simply by re-vaccination?—And also there are statistics given by Steinbrenner of cases of small-pox in which the character of the scar was carefully taken.

11,892. (*Sir William Savory.*) How many?—While looking out the reference I should like to hand this sheet of drawings in as showing what fallacies may arise from the character of the scar. These are prepared by M. Decanteleu and show that with the "vaccine" you may get 70 different varieties of scars.

11,893. (*Professor Michael Foster.*) Why does he limit himself to 70 varieties?—He has drawn every possible kind of scar which may result from vaccination. M. Layet points out that such differences result from the use of the same lymph, and that the scar depends upon the age of the individual, the way in which the operation is performed, differences of constitution, and so on.

11,894. (*Sir William Savory.*) When I asked you the question as to M. Layet's statistics, it was not with regard to the number of scars, but with regard to the proof of vaccination. I wanted to know what evidence he had as to these children having been previously vaccinated, whether he referred to the scars upon the arm or referred to the reports of parents and friends; because, as I understand, he gives no evidence of previous vaccination, he merely gives the statement that they had been previously vaccinated?—He makes a general remark about the scars, but he does not give the details.

11,895. What does he say?—He says that some had good scars and others indifferent scars. Then he draws attention to the fact that he now pays no attention to scars, because with the same lymph he gets good and indifferent scars.

11,896. You are aware of evidence to the contrary, are you not? You are aware of Marson's statistics?—I am aware of Marson's statistics; but I think it is a great fallacy that the mortality from small-pox after vaccination should be explained by the character or the number of the scars.

11,897. (*Chairman.*) Did M. Layet publish any table as to the results at which he arrived of the relation of successful re-vaccination to the character of the scars?—No; it was merely from his general experience.

11,898. It was a general impression from his experience and not tabulated results?—It was not tabulated results, but he quotes Kelsch who gives figures. With regard to the question Sir William Savory asked me (Question 11,892), it is impossible for me to go fully into all the details of the subject, but I would refer the Commission to Steinbrenner at pages 664, 665, and 666, where he quotes Dornblüth, Cross, Von Stosch, Franqué, Sunderland, Wagner, and others; he says that all this mass of facts is quite against Gregory's theory, that the number of scars is an index of the protective quality of the vaccine.

11,899. (*Sir William Savory.*) You think this evidence quite outweighs the evidence to the contrary?—I think that all that evidence together with Layet's evidence certainly outweighs Marson's figures.

11,900. But there are others besides Marson's. You have gone into the whole subject, have you not?—Yes; but Marson's are the most important.

11,901. You have gone through the whole subject and considered the evidence on both sides?—Yes, on both sides.

11,902. Having considered the evidence on both sides you have come to the conclusion that the evidence in favour of the view that the scars count for nothing overwhelms the other?—Yes, I do; also from one's knowledge of experimental pathology, and a fact which I have heard even acknowledged at Lamb's Conduit Street, that if you inoculate a calf in one place, if perfectly successful, there is exactly the same protection as if you inoculated in 60 places.

11,903. But you are aware also that in official vaccination a good deal of importance is attached to the scar?—Yes; and that is a great fallacy.

11,904. But that is the fact, is it not, they do attach a great deal of importance in official vaccination to the character, size, and number of scars?—In this country, but not in France.

11,905. Nowhere else?—I do not know about Germany.

11,906. (*Dr. Bristowe.*) Have you any statistical evidence of value which you can quote against that of Marson and Gayton?—Not so extensive as Marson's; but if statistics are based upon a fallacy it does not make them less fallacious because they are extensive.

11,907. The question of any fallacies there may be in Marson's cases you have not gone into yet?—I am bound to say with reference to the question of the character of the scars, that owing to the prevalent belief that small-pox protects through life, either partially or completely, there is the danger of explaining away cases giving contrary evidence, by looking at the scars; and I must admit that if anyone studies that table which I have handed in it gives you a possible explanation for every case of small-pox following vaccination; for you have only to say that the scar is not formed as it ought to be to explain away every case.

11,908. (*Dr. Collins.*) Are you aware that Dr. Gregory at Highgate, the predecessor of Marson, held the opposite opinion?—I am not aware of that.

11,909. (*Sir William Savory.*) Do you know whether Dr. Gregory went into the matter as Marson had done and produced tables?—Certainly. I think that it was too readily adopted as a ready explanation of small-pox after vaccination. I myself do not believe that cow-pox exercises, as I have said, anything more than a transient antagonism; and I believe the scar theory is a very convenient mode of explaining away outbreaks of small-pox which occur in spite of vaccination.

11,910. (*Chairman.*) But after all is not that a question to be determined rather as a matter of fact? If you find in a large number of cases that the death-rate diminished, I will not say exactly in proportion but in relation to the number of scars, would not that tend to show that the number of scars had some relation to the extent to which vaccination was a protection?—I think it shows what I suppose most will admit, that statistics may occasionally be fallacious.

11,911. They may be occasionally fallacious no doubt. If you have some reasoning which will show either that this could not be the case, or that it is enormously improbable that it should be the case, then you may say that, notwithstanding these statistics, I ought not to believe it; but unless there is some such reason for disbelieving it, why should one do it?—There is a reason, because on purely pathological grounds it is incomprehensible that it should depend upon the dose of the virus given in that way. When it is definitely shown that one vesicle will protect as much as 60 upon the calf how can there be any difference in mar between five successful vesicles and six, or between three and four.

11,912. But supposing the marks left bore some relation to the severity with which the disease had been had? Then it becomes a question of the quality of the work?—There, I think, the great danger we have to avoid, if I may call it a danger, is this: that starting as most of those who have made these statistics have done

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with the view that cow-pox does effect a life-long protection, either complete or incomplete, they feel that there must be some explanation for every case or outbreak of small-pox after vaccination. If a case comes before them, and it is a case of confluent or severe small-pox, there is an unconscious tendency on looking at the marks to say that they are not deep enough or not large enough. See what a variety of explanations you have when you have no less than 70 different scars to choose from!

11,913. If I recollect aright, in the case of Dr. Gayton's statistics the marks were recorded when the patient first came to the hospital; it was not a conclusion subsequently arrived at, but they knew what course the disease would run?—I may put it in this way: these statistics would be of value if there were any other means of registering the character of the marks than by the person who writes down the diagnosis; then I think the figures might be of some value; but it would be very difficult to accept that opinion when it is acknowledged by all those vaccinators I have met (and I have visited several vaccine institutions in France) that with the same lymph used on different children you get different scars and different results.

11,914. (*Sir William Savory.*) But that would not affect the main result, would it?—If you had small-pox after certain scars, then if the small-pox is to be made to depend upon the character of the scar, whether it is too superficial or too deep, I say that to any one who is prejudiced in favour of a belief in the protection of vaccination against small-pox, that is to say, in more than a transient antagonism, there is the danger of saying that the scar was not satisfactory.

11,915. Is there no danger on the opposite side?—I do not think so, when you have the evidence of a man like Layet, who if he had any unconscious prejudice at all, he being a thoroughly reliable and conscientious man, would have a prejudice in favour of vaccination.

11,916. You think that a great deal turns upon the character of the observers in these cases, that those who have made the observations on the one side are much more trustworthy than those who have made the observations on the other?—No, I do not think it depends upon the character of the individual, it depends upon his belief, which would lead him to one view or the other.

11,917. Do you know how many observations Mr. Marson made?—I think upwards of 16,000.

11,918. And how many do those on your own side amount to altogether?—I have not added up the number, but there would be no difficulty in adding up the

number. I should think more than that. Kelsch alone gives 1,479 of individual cases examined and reported upon. However, I do not think that numbers make any difference if you start with a fallacy to begin with.

11,919. (*Chairman.*) Would it not? The greater the number upon which the uniform result is arrived at, the greater the probability that that result has a meaning, is not that so?—Speaking generally, that would be the case.

11,920. (*Dr. Collins.*) As the question has been put to you with regard to sides, have any of those observations you quoted been made by those opposed to vaccination?—No, those writers are all in favour of vaccination.

11,921. (*Sir William Savory.*) But this is a question of protection according to scar. Those who believe in vaccination may hold very different opinions upon that point?—I have given the opinion that I have, because though you may not have such elaborate statistics as Marson's yet they are statistics taken from France and Germany, commencing in 1820, which support the pathological conclusion.

11,922. Which, in your opinion, quite outweigh the results of Marson, Gayton, and others?—Yes, those taken together with the results of one's experimental experience would outweigh Marson and Gayton.

11,923. Would you tell the Commission what you mean by "experimental experience"?—A knowledge of viruses, such as the experimental vaccination of calves. If you vaccinate a calf in one place, provided that one place takes, you have the same protection as would be afforded by 60.

11,924. Are you sure of that?—Yes.

11,925. On what grounds?—The ground of the subsequent testing of the vaccination.

11,926. In what way?—By the re-vaccination of the calf.

11,927. Do you mean to say that in the introduction of an animal virus into the system the quantity would have nothing to do with the result?—I have not observed any difference in the result.

11,928. Would you express the positive view that the quantity of virus introduced would have no effect upon the result?—I should in cow-pox, anthrax, or tubercle.

11,929. You are quite prepared to state authoritatively that the quantity introduced would have no effect upon the result?—I think not.

11,930. You think that is borne out by observations upon the various forms of blood infection?—Yes; with pathogenic micro-organisms.

Adjourned till Wednesday next at 1 o'clock.

## Forty-ninth Day.

Wednesday, 26th November 1890.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Mr. CHARLES BRADLAUGH, M.P.

Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.  
Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. BRET INCE, *Secretary.*

Professor EDGAR MARCH CROOKSHANK, M.B., further examined.

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11,931. (*Chairman.*) I believe you desire to make some further remarks with regard to the theory that there is a connexion between the number of the scars and the protection afforded by vaccination?—The point

I am anxious to draw attention to is that after an experience of nearly a century of small-pox inoculation it was never believed that the constitutional effects depended upon the number of places of inoculation. It was custo-



mary for the early inoculators to inoculate in one place, and the disease either took or did not take. Then, again, I think it is generally believed that in syphilis the constitutional symptoms bear no relation whatever to the character of the scar. I have never heard it suggested that there is any difference in the result, when the scar is a large one or a small one, nor, so far as can be judged from Auzias-Turenne's experiments, was there any difference, although some of his patients were inoculated in as many as 30 places.

11,932. (*Sir James Paget.*) But he never suggested that syphilisation producing one scar had the same effect as a long course of syphilisation producing many scars; and the same would apply to the experiments of Boeck, would it not?—We have no evidence in those cases of there being violent constitutional symptoms.

11,933. But they never considered it to be a protective with one scar. If there is any analogy in the matter, this would surely indicate that the effect of many scars from vaccination would be, in some measure, similar to the result of many scars from syphilisation?—In syphilisation the inoculations were repeated.—

11,934. That was their ordinary practice, their syphilisation consisted of a long series of inoculations with the syphilitic virus extending over many weeks or even months; and they did not consider one syphilitic inoculation nearly sufficient to produce the effect they desired?—That result must be regarded as arising from a succession of mild doses of syphilis.

11,935. (*Dr. Collins.*) Was not the object of the serial inoculations of syphilis by Boeck and Auzias-Turenne to ascertain when the time arrived at which the constitution would be no longer affected by syphilis, rather than to increase its constitutional effect upon the patient?—I believe so.

11,936. (*Sir William Savory.*) Was not it the fact, also, that as the inoculation experiments succeeded each other there was a gradually decreasing intensity in the severity of the symptoms?—That is quite true, and that should be rather attributed to the succession of mild attacks. My point is that by inoculation at one sitting in a number of places the constitutional effects were not increased in severity.

11,937. (*Dr. Collins.*) May not the decreased effect of the later inoculations have been due to the effect of the previous inoculations?—Yes, no doubt.

11,938. (*Sir James Paget.*) But whenever they inoculated with syphilitic virus they inoculated in five or more places?—Not in all cases. In some of Henry Lee's cases, as well as in Auzias-Turenne's cases, you will find that they inoculated in one place, and then when the chancre developed they inoculated in another.

11,939. (*Sir William Savory.*) But in these very cases you have been quoting, where there was a successive inoculation from chancre after chancre, there was a gradual decline in the severity of the symptoms?—Yes; when there was a repetition of the inoculation. I only put forward the experiments as rather bearing out the view derived from one's clinical experience that the constitutional severity of the symptoms does not depend upon the number or the character of the scars, that is to say, the quantity of virus inserted.

11,940. Does not that seem rather contradictory to your view?—I think not; there was no evidence either from the successive inoculations or the multiple inoculations at the same sitting of there being an increase in the severity or violence of the constitutional symptoms.

11,941. (*Chairman.*) Speaking merely as a layman, supposing the vaccination takes only to a slight extent, in that case there would be but little constitutional disturbance; would not there also be but little mark left; or do you mean that there is no relation between the extent to which the vaccination operates and the appearance left upon the arm?—I think there is no evidence of any relation. I look upon it in the same light as variolous inoculation; as far as I can gather from the descriptions that were given there was no difference in the local effect upon the arm, although in one case it might be followed by mild small-pox, while in another case the inoculation might produce confluent small-pox.

11,942. (*Sir James Paget.*) You think that the quantity of the virus does not at all determine the degree of the severity of the disease in the patient?—Not at all.

11,943. Is that true of any other disease?—It is true of tubercle and anthrax.

11,944. Taking Pasteur's experiments, for example, in rabies is it not necessary to be very particular as to the quantity of the material?—We know so little of the nature of the rabic virus that it is difficult to draw any conclusions from that.

11,945. (*Dr. Collins.*) Can you tell the Commission whether the constitutional symptoms arising as the result of these syphilitic inoculations in those not previously affected with syphilis were milder or less mild than in the case of those acquiring syphilis in one place in the ordinary way?—They were much milder.

11,946. (*Sir William Savory.*) Towards the conclusion of last Wednesday's evidence you spoke of your experimental experience, and said that it meant the inoculation of calves in relation to the protective influence of vaccine against subsequent inoculation; could you tell us how many calves you inoculated with vaccine altogether?—I have myself personally re-vaccinated very few indeed, but I was speaking there generally and not of my own personal experiments. I was using the experimental vaccination of calves as illustrating my experimental knowledge of viruses in general, and not because I had had great experience in the re-vaccination of calves.

11,947. Can you give the Commission something a little more definite as to the number of observations you have made, which you quoted as inducing you to believe a certain fact?—With regard to the re-vaccination of calves that would apply to only five or six.

11,948. Were those your own personal observations upon calves, or were they carried out by others?—My own.

11,949. Can you tell the Commission the period after the primary inoculation when you tested the result by a secondary inoculation?—About four weeks.

11,950. Would not the duration of the period be a most important matter with respect to the protection afforded by vaccination?—Yes.

11,951. So that four weeks is a very short period. A single inoculation might protect for four weeks, but there is no evidence, is there, to show that upon a calf three times the number of inoculations would not protect for a much longer period?—No, that is so. We have very little evidence at all as to the effects of re-vaccination of calves. Even at Lamb's Conduit Street the experimental re-vaccinations have not been carried on beyond, as far as I can gather, the interval of a month.

11,952. I understand that you say, at any rate, that all these tests have been applied within a very short period indeed?—Yes.

11,953. And you would allow that the duration of the protection was a most important matter?—Yes; but I should like to point out that I referred to the re-vaccination of calves only as an illustration of what I was saying. My own experiments of inoculation with the viruses of anthrax tubercle and chicken cholera, from which I drew that conclusion, are very extensive.

11,954. (*Chairman.*) You next wish, I believe, to furnish some references which were desired by some members of the Commission at the last meeting as to the position of Jenner and Woodville?—I have gone very fully into this matter; the questions referring to it are Questions 11,795, 11,796, and 11,800, 11,804, 11,805, and 11,823. The point I have to deal with to-day is, as I take it, that doubt was thrown by your Lordship upon the accuracy of my conclusion that Jenner had lost his lymph, and that vaccination was practically at a standstill until Woodville appeared upon the scene and disseminated far and wide his variola-vaccine. I propose to settle this point by giving you the history of vaccination from its inception, and I will ask the Commission to be patient with me while I make what will necessarily be a somewhat lengthy statement. I will give you chapter and verse for every statement that I shall make. It has cost me a great deal of time and labour at the British Museum in looking up the authorities, but I think very little of that as it gives me an opportunity of proving the accuracy of my statements; but as it involves a short history of the introduction of vaccination, I would ask you to allow me to preface my remarks by reading a passage written by Dr. B. W. Richardson in the December 1889 number of the "Asclepiad": "There was an idea all but universal that it was a necessity for every person once in life to suffer from small-pox. The universal acceptance of the process of inoculation

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" had given rise to this barbarous superstition ; and as the teachings of modern sanitary science that communicable diseases would cease if proper measures of perfect cleanliness were taken for their suppression had not then been communicated, the mind of the people was set on the belief that something inoculatory must be done, or fatality from small-pox must be great. The process inoculatory up to that time was small-pox inoculation, but such inoculation produced a contagious disease, and did not always succeed even at that cost. Given then a new inoculation that did not induce a contagious malady, but did succeed in protection, and a veritable miracle were instituted. Man had conquered nature. According to the prevailing opinion held in Gloucestershire and Dorsetshire, Benjamin Jesty acted practically, and apparently with successful results, when he inoculated his family with matter derived from the teat of the cow suffering from the disease commonly called cow-pox, which Jenner cleverly latinized into *variolæ vaccinæ*. In this act Jesty did everything that could be desired for accomplishing the miracle named. He maintained the old method of inoculation ; he induced a disease which protected from small-pox, and he induced a disease which was not contagious, above everything else the success that was wanted. These were the three points most conspicuous in the inquiry into the causes and effects of the *variolæ vaccinæ*, and as on trial by other observers the experience of successful vaccination was soon afterwards, on Jenner's suggestion, satisfactorily followed up in London by Mr. Cline, Drs. Pearson and Woodville, and other medical men, the proceeding was rapidly advertised all the world over, and Jenner and Jennerian practice became familiar on every tongue. A last point advanced was, that whereas small-pox inoculation left many bad after-effects, cow-pox inoculation left none whatever, but in regard to some diseases, like scrofula, exerted a beneficial rather than an injurious effect. Jenner was indeed a fortunate man. He came out with his 'Inquiry' just in the right nick of time. By the slightest touch of description he transformed a local belief or practise into a national one, and scored the first place as a medical observer and pioneer. It is truly painful to say that the common opinion about the great labour of experiment to which Jenner submitted himself before he announced what is wrongly called his discovery is mere childish adulation. His experiments are enumerated by himself, and may be put, with observations without experiment, at twenty-three, so that, compared with the intense labour by which researches of a physiological kind are ordinarily carried out, they really rank as nothing in respect to labour. They were not, in any sense or any particular, original. At the same time they need not be accepted for being what his enemies call deceitful or crafty. They were simply innocent researches gathered from commonplace experience, which by good fortune of time and circumstance were turned into extraordinary fame."

11,955. What is the purpose of reading this, because it seems a very long way from the question of fact as to the point about Woodville's and Jenner's lymph ?—I wanted to explain how Jenner appeared upon the scene, and what he had exactly done, and then to pass on to the position occupied by Woodville.

11,956. That is a long way from the point upon which I understood you were going to supplement your observations, namely, did Jenner cease to have his lymph in 1798, and were all the vaccinations subsequent to that time with Woodville's lymph ?—Not all, but almost all.

11,957. That is a question of fact which we are open to deal with ?—Then I will deal first of all with Jenner's position. Jenner's first experiment was performed upon James Phipps ; I must give you all the particulars, otherwise I shall be cross-examined with the result of causing confusion in the order of the evidence I should like to lay before you. This was on May 14th, 1796. No further inoculations were made. The paper which Jenner sent to the Royal Society was rejected ; he determined, however, to add to it, and he published it on his own account. He tells us that his researches were interrupted till the spring of the year 1798. This will be found in the second volume of my book, page 20. In February 1798 a case of horse-pox occurred which became the source of Jenner's first stock of lymph. The pedigree of that stock is given in the first volume of my book on page 274. It passed from the horse to the cow and from the cow to William Summers. From

William Summers the disease was transferred to William Pead, after the manner of arm-to-arm variolation. From William Pead several children and adults were inoculated, three suffered from extensive erysipelatous inflammation. From one of these patients, Hannah Excell, matter was taken and inserted into the arms of John Marklove, Robert F. Jenner, Mary Pead, and Mary James. From Mary Pead lymph was taken to inoculate J. Barge. Now with J. Barge that stock ceased, and from April to July, for three months, Jenner was at Cheltenham, having no lymph, and being afraid that his son had been exposed to small-pox, he inoculated him with small-pox ; that was on August 18th, 1798. I now refer to Baron, Volume 1, page 153, there is a memorandum from Jenner referring to his first stock of lymph in which he says : "With the intention of proceeding with the experiments, Mr. Cline took matter from the pustule, and with it inoculated three other children ; but on none of these did it take any effect. I have observed that the matter of cow-pox appears to lose its powers of infection after it ceases to be limpid. Probably it might have passed the bounds of perfection when Mr. Cline made his second experiment." Mr. Cline wrote to Dr. Jenner and said : "My dear Sir.—Seven days since, I inoculated three children with cow-pox matter, and I have the mortification of finding that the infection has not taken, and I fear I shall be entirely disappointed unless you can contrive to send me some fresh matter. I think it might come in a quill in a letter, or inclosed in a bit of tinfoil, by the same conveyance, or in any other way that may be more convenient." Baron, to whom we are indebted for publishing this letter, continues by saying : "Mr. Cline having failed to propagate the disease from the first case of successful vaccination which occurred in London and, Dr. Jenner having at that time no fresh lymph to transmit, it was not in his power to gratify the anxious wishes of the many professional men who now eagerly sought an opportunity of witnessing the progress of the affection, and of putting its alleged prophylactic powers to the test."

11,958 Does that prove that he had not any at that time to transmit, or that he had not any at all ? Does it show that there had been no cases in which he had vaccinated because in your book I see, on page 280, that one Elizabeth Wynne caught cow-pox in 1798. If she had cow-pox there must have been some cow-pox about ?—But from 1796 to 1798 Jenner says that cow-pox was absent from the dairies and then he publishes his account in which he gives you all his experiments. I propose to give you almost week by week a history of his life at that period in which he says that he has no lymph to send. Now, proceeding, this loss of lymph was in August ; and then on September 27th, the next month Jenner received the proof sheets of Pearson's book. Pearson had not performed any experiments with cow-pox but had been getting together historical evidence and general experience on the subject. Pearson wanted some lymph. Here is Jenner's reply. You will find it in my book, Volume II., page 84 : "It is painful to me to tell you, that I have not an atom of the matter that I can depend upon for continuing the experiments. Mr. —, when he inoculated the boy, did not take matter early enough from the pustule to secure its efficacy, for after it has lost its limpid quality, and becomes pus, I fear its specific effects cease." Then, on November 8th, Pearson writes to Jenner again : "If I can but get matter I am much mistaken if I do not make you live for ever." Then, on November 13th, Pearson again writes to Jenner : "I wish you could secure for me matter for inoculation, because, depend upon it, a thousand inaccurate but imposing cases will be published against the specific nature of the disease by persons who want to send their names abroad about anything, and who will think yourself and me fair game. By way of *se defendendo* we must inoculate." (Baron, I. 306). Now from Baron's life of Jenner, Volume I., page 303, we see what was going on for the next three months : "Dr. Jenner remained chiefly at Cheltenham and Berkeley from the time of his leaving London in July 1798" (that was from the time of the publication of his book) till the following February. During this period he was most assiduously employed in collecting additional information respecting the *variolæ vaccinæ*, and in carrying on an extensive correspondence with medical gentlemen in different parts of the kingdom ; but his stock of vaccine matter having become exhausted, and being disappointed in supplies from the dairies, he could not answer all the demands that were made to



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"him for virus." Now understand what Baron means by the last sentence, because he says, "It was not until the end of November that he was able to procure any."

11,959. November of what year?—1798. "On the 27th of that month he inoculated two of the children of his friend Mr. Hicks, of Eastington, with matter taken the preceding day from a farm at Stonehouse." Now, from other sources, I am able to give the pedigree of Jenners' Stonehouse lymph. He inoculated Hicks' two children (Baron, Volume I., page 303), but after a few months we find that those children of Mr. Hicks were inoculated successfully with Woodville's variola vaccine, so we may conclude that the first inoculations failed.

11,960. But is it not conceivable that Baron may have made a mistake in naming those whom he says he so inoculated?—That is possible.

11,961. The important point is that at all events, he got some lymph in 1798?—Yes. Here is the pedigree of it. Jenner inoculated Susan Phipps whose arm ran into an ulcerous state.

11,962. Where are you taking this from?—It is from Jenner's own publication, his "Further Observations": From Susan Phipps Mary Hearn was inoculated; sores formed with a disposition to inflame, and Jenner treated them with acid nitrate of mercury ointment. We have no further account of the case: no doubt the fact of the sores having inflamed and requiring to be treated with acid nitrate of mercury ointment was the reason why no further lymph was taken.

11,963. Does he say that that was the only case in which he used the Stonehouse lymph?—That is the only one of which we have any record; he could not have gone on with it, because in another week he writes saying that he has no lymph.

11,964. Where is that stated?—With reference to this Stonehouse lymph, I find that Mr. Thornton took lymph from the same cow, and he vaccinated some patients. Then afterwards he tested them with variola and they took, so he did not continue it.

11,965. (Professor Michael Foster.) Are those the Colborne cases?—No, those were the children of Mr. Stanton.

11,966. (Chairman.) Where is this to be found?—It is published in Dr. Beddoes' "Contributions to Medical Knowledge"; and I should like to put in these cases because they are fully described. It is as follows: "Letter from Mr. Thornton, surgeon, Stroud, dated February 7, 1799. In consequence of your letter to me of the 1st instant, I send you the following account of my experiments relating to the cow-pox. On the 1st of December 1798, being informed that the cows on Stonehouse farm had the cow-pox, and that a man who milked them was infected with the disease, I called on him that day and found him with pustules on his hands and fingers, which had made their appearance four days before. The patient had not had the small-pox; the symptoms he experienced previous to the eruption (he told me) were pain in his head and in the axillæ, with frequent cold shiverings, fever and debility; on the second day the cow-pox broke out, which terminated his complaints. I that evening went to Stafford's mill, and inoculated Mr. Stanton and four of his children; the eldest was ten years old, the youngest about ten months. On the third day all their arms appeared to be under the influence of a very active virus; the arm of the youngest child was affected with a kind of erysipelatous inflammation, size of a half-crown piece, without any elevation of the cuticle; it was half an inch above the place where the matter was inserted; with which it did not seem to be in the least connected; on the fourth day, inflammatory appearances of the three eldest were increased, the youngest child's arm had lost that efflorescence, but about the puncture the redness was increased. Mr. Stanton's was evidently on the decline and from this time gradually died away. On the sixth day the skin round the incisions of the children's arms was considerably elevated and contained a limpid fluid. The inflammation in each kept on till the fourteenth day, when punctures began to be covered with a crust of considerable thickness, from which an ichorous matter continued to discharge for several days, without any diminution of the surrounding inflammation. About the twentieth day the scabs fell off, and the inflam-

matory appearances subsided. During the whole process, there was no commotion excited in the system, nor the least pain or uneasiness perceived in the axilla of either. From the long continued local excitement I began to entertain a hope that the virus might imperceptibly have crept into the habit and proved a security against the variolous infection. To relieve my own doubts, and to ensure the safety of my patients, I had immediate recourse to the introduction of the small-pox matter. All the children received the infection, and passed through the different stages of the disease in the usual slight manner. Mr. Stanton's constitution resisted my repeated attempts to communicate it to him. I therefore, as he spent the early part of his life in London, inferred that he might have had the small-pox slightly during that period. Concerning Mr. Colborne's children, I have received authentic information 'that three of them were inoculated with cow-pox matter, together with a servant man; two of the children suffered severely from violent inflammation, and alarming ulcerations in their arms. They were all inoculated afterwards with the small-pox matter; the two whose arms had been so dreadfully affected did not take the small-pox, the others received it.' If you should think this communication deserving a place in your intended publication you may insert it. (Signed) Edward Thornton.—To Dr. Beddoes, P.S. Some cases of cow-pox have lately occurred in this neighbourhood. If on further investigation they appear to throw any light on the subject, which they bid fair to do, I will take the liberty to let you know the result of my inquiries; they at present appear to operate against Dr. Jenner's doctrine of security."

11,967. Your last statement would seem to show that Jenner was not the only person who was getting cow-pox matter and using it for vaccination purposes. Your assumption seems rather to have been that the 6,000 persons whom Jenner mentions must all have been vaccinated with the Woodville lymph, because there was no other source for it, and you prove that, as you think, by proving that Jenner had no lymph; but possibly there may have been other lymph. Jenner says there had been 6,000 cases; he mentions that when he is pointing out that the Woodville cases are not satisfactory but are open to question on account of variolation. You say that those 6,000 cases are all cases of Woodville lymph. It is desirable for you to prove that assertion, which suggests itself to my mind as rather doubtful from the connection in which Jenner is speaking of these 6,000 cases when he is speaking of Woodville's lymph?—We have the history before us; practitioners when they inoculated either gave independent evidence in the journals, or communicated with Jenner; and we have the direct statement of Pearson and Woodville saying that there was no lymph in currency.

11,968. Dr. Jenner speaks of 6,000 cases, but he nowhere gives the details of the 6,000 cases or anything like that number, does he?—No, he makes that statement after Woodville's experiments.

11,969. But does he anywhere give details or refer to anything like that number?—Of his own, no.

11,970. Of his own, or any other persons to whom he especially points?—No.

11,971. Then why do you assume that there may not have been many cases of which Jenner reserved the particulars, or may have had experience of which he does not give the details?—Because if that had been the case the men who performed the vaccinations would have at once contradicted Pearson's and Woodville's statements. Men do not make statements in medical journals of that nature without their being at once contradicted.

11,972. (Sir James Paget.) Do you think that was so at the beginning of this century?—Yes, I do.

11,973. (Chairman.) Do you think that many country medical men read the "Medical and Physical Journal"?—The country practitioner had either "Beddoes' Com-mentary" or the "Medical and Physical Journal," or he would have communicated his results by letter to Jenner. It must be remembered that Jenner was himself having a controversy with Woodville, and if Jenner could have put forward any claim to the 6,000 cases he would have done so in his reply to Woodville.

11,974. What number do you put Woodville's cases down at, at the time Jenner mentions the 6,000?—Quite 6,000, and probably more. I have added up some of



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the cases of vaccination performed by the practitioners to whom Pearson sent the Woodville lymph; some inoculated 100 and some more, so that within a fortnight of the sending out of Woodville's lymph I daresay that there were 20,000 cases.

11,975. Are the particulars of these cases recorded?—No, but supposing every practitioner upon receiving Woodville's lymph inoculated 100 children, that would amount to 20,000 cases.

Then with reference to the Stonehouse lymph, some of it was obtained by Dr. Darke. Dr. Darke's servant Vick, Mr. Colborne's three children and King, Mr. Colborne's servant, were inoculated. Vick failed, showing on the sixteenth day a small scab. Miss Colborne showed some hardness and elevation hardly perceptible on the sixth day, on the tenth it was quite gone. Miss S. Colborne showed hardness and elevation to the ninth day, the crust fell off on the fourteenth. They were all inoculated with small-pox on the eighth day from their inoculation with cow-pox and all took. Miss E. Colborne and W. King both had ulcers and were treated with mercurial ointment; and I take it that that stock stopped or otherwise Jenner would have had some to send. That brings us to February. On February 15th, 1799, Jenner received Woodville's *variola vaccine lymph*, he received it from Pearson. Pearson sent him a thread infected with the virus. Pearson and Woodville were at that time performing these inoculations in London and, in fact, they set vaccination going. Jenner's nephew, Mr. George Jenner, wrote to Jenner from London, begging him to repair to London, saying, "Now is your time to establish your fame and fortune." Jenner, persuaded by his nephew's letter left for London on March 21st. Now this lymph which had been sent to Jenner on February 15th was Woodville's, and with it he inoculated Stephen Jenner and James Hill; from James Hill he inoculated Mr. Hick's children, and the servants and people in Mr. Hick's manufactory. From the same source he passed the lymph on to Dr. Marshall, who vaccinated with it 107 persons in March and April, and later on in September 189 more. We know that Jenner had not been able to send Pearson any lymph up to the 20th of January 1799 because Baron again says (page 306), "Dr. Pearson and other gentlemen went on speculating and doubting and deciding on Dr. Jenner's doctrines without ever having seen at the time an example of cow-pox, or having given due consideration to his arguments in favour of the opinion as to the origin of the disease. Matters continued in this state till about the 20th of January 1799, when it was discovered that the cow-pox existed in a dairy in Gray's Inn Lane, London. This occurrence was made known to Dr. Jenner by Dr. Woodville." Now in spite of that discovery by Woodville of cow-pox in London Jenner still could not get cow-pox in the country. We find in Baron's life of Jenner, Volume I., page 317, that he writes on March 13th, 1799, to Pearson: "No cow-pox yet in the country. Should it appear within a particular district I shall undoubtedly know it. It cannot now be long before I shall see you in town; at least I can speak with as great a certainty of being soon there as a medical man can. I hear of a child covered with pustules at the Small-pox Hospital. What are they?"

11,976. That does not show that he had not any humanised lymph at the time; it is only that there was no cow-pox about in the country?—The only lymph he had then was the lymph he had sent to Marshall.

11,977. He does not say so, does he?—Yes. Then Jenner went up to London to see all Pearson's and Woodville's vaccinations, and he endeavoured while there to procure some virus at Mr. Clark's farm at Kentish Town, so that after Woodville had set this *variola vaccine* in currency, then, as I said on the last occasion, Jenner had got lymph from Kentish Town. That lymph was collected by Tanner, a student at the Veterinary College, from whom Jenner procured it and immediately conveyed it to Dr. Marshall in Gloucestershire, who had been using Woodville's lymph. Marshall inoculated 127 cases with this Kentish Town lymph, and about 100 cases were inoculated by Henry Jenner. So that with regard to Marshall's cases there were 296 with Woodville lymph and 127 with the Kentish Town lymph, making altogether 423. Of those 211 were subjected to the action of variolous matter "but every one resisted it." (Marshall.) Then while in London Jenner had another stock of lymph. This was Jenner's North Nibley lymph, that was another stock he was using; it had been sent up to him from the country; but at the same time although he had

that lymph, he nevertheless used Woodville's lymph. The North Nibley lymph was sent up in April 1799. Jenner wrote to King on September 18th, 1799, and this you will find in Baron's life, Volume I., page 358: "When I had the pleasure of receiving your letter there was no cow-pox matter here in a fit state to send you. That which is enclosed was taken about four days ago, and, if soon made use of, will doubtless, prove efficacious. This matter is from the source mentioned at the conclusion of my second pamphlet. It has been passing from one patient to another for upwards of six months, and, except in the single instance, I have mentioned, I have seen no pustules produced by it; indeed, in that instance, they did not mature." When I first read that letter I thought that Jenner must have been using a new stock of cow-pox of his own, but turning to the second pamphlet I find that that lymph was no other than Woodville's *variola vaccine*.

11,978. Where is that?—On page 185 of my second volume; he is describing the lymph at the conclusion of his second pamphlet. And at the bottom of page 184 you will see: "From communications, with which I have been favoured from Dr. Pearson, who has occasionally reported to me the result of his private practice with the vaccine virus in London, and from Dr. Woodville, who has also favoured me with an account of his more extensive inoculation with the same virus at the Small-pox Hospital, it appears that many of their patients have been affected with eruptions, and that these eruptions have matured in a manner very similar to the variolous. The matter they made use of was taken, in the first instance, from a cow belonging to one of the great milk farms in London." Then he describes the cases of Stephen Jenner and James Hill, and at page 186 the lymph which was used for Mr. Henry Hicks' children was that which was used by Marshall; and then Jenner describes at the conclusion of his second pamphlet that the lymph he was using was none other than the *variola vaccine lymph*. I will now hand in a paper giving the pedigrees of the various stocks of lymph to which I have referred. (The paper was handed in. See Appendix I., page 410.)

So that to sum up Jenner inoculates James Phipps with cowpox on May 14th, 1796. Then there being no cowpox in the dairies his researches are interrupted until the first stock of lymph (horse-pox) is started on March 16th, 1798. Then, there being no lymph at Cheltenham for three months, Jenner variolates his son Robert. He then goes to London and is unable to vaccinate a single case with success. I had omitted to mention that when Jenner went up to London to demonstrate vaccination he was unable to demonstrate it in a single case; he stayed for some months in London but could not demonstrate it in a single case, but he had left a quill of lymph with Cline, and Cline succeeded in inoculating a boy, and then Cline failed to carry it on, so that Jenner's stock was lost. In the summer of 1798 some Berkeley lymph was tried from the cow and all failed. On September the 10th, 1798, Francis Knight writes for lymph (Baron, Volume I., page 160), but Jenner has none to send. On September 27th Jenner informs Pearson that he has no lymph. On November the 8th, 1798, Pearson is anxious to try the new inoculation, and on November 13th, 1798, Pearson writes again to Jenner imploring him to find some lymph. On November 26th we have a fresh stock from Stonehouse farm tried by Jenner, which produces ulceration and the lymph is lost. Then we have, as Baron says, matters continuing in this state till January 1799. Then we come to Pearson-Woodville *variola-vaccine lymph*, which in a short time was distributed all over the continent. Then on February the 15th Jenner received a thread infected from Bumpus who had 310 variolous pustules. That was the lymph to which he refers at the end of his second pamphlet; but this summary is not obtained from Jenner's work; I have had to search through different publications to get the information together.

11,979. I assume that in your opinion this proves that all the early cases were cases of variolation and that the experimental test of variolation proves nothing as to vaccination?—Yes, practically all those cases of early vaccinations were really variolations. Immediately after this *variola vaccine* had been distributed all over the country, Jenner got some lymph from North Nibley, but apparently nothing is done with it; he has lost it because he writes to Ring saying that he is unable to send him any. Then there is a supply of lymph obtained from Clark's cow of Kentish Town, and then finally, on September 18th, we have Jenner sending Ring same lymph, and that lymph is none other than the Woodville lymph.



11,980. Does that exhaust the evidence which in your view establishes the fact which you assert, as I understand, that all this early vaccination was not vaccination at all, but variolation?—Yes; but let me explain the object of this evidence. If your Lordship's will refer to the questions you were asking me yourself, this evidence definitely proves that there were a few abortive attempts to get lymph, but as I say there was none in currency in the profession until the Pearson-Woodville lymph was disseminated.

11,981. But what is the importance of it? I understand, as I put it to you just now, that what you are driving at is to show that the early vaccination is not vaccination but variolation, and that therefore the variolous test proves nothing because it was not a variolous test after vaccination, but a variolous test after variolation?—That is so.

11,982. Jenner says he had inoculated from different cows in 1797, 1798, and 1799; do you accept that statement?—I can hardly accept the statement as applying to 1797, because that would be contradictory to his former statement and to the published facts.

11,983. But here are his words at page 252 of the second volume of your book: "The matter with which my inoculations were conducted in the years 1797, 98, and 99, was taken from different cows." You quote reasons for believing that Jenner did not inoculate from any cows in 1797, do you ask us to believe that Jenner was inventing in making this statement?—He might have made a slip, because he tells us that after 1796 there was no cow-pox in the dairies and his researches were interrupted until 1798.

11,984. His researches may have been interrupted, but still he may carry on inoculations, he might consider inoculations not as researches. You consider that the statement that his researches were interrupted is sufficient to warrant us in thinking that he ceased to inoculate; have you any reason to suppose that the lymph which Marshall had from Jenner from the cow was used by nobody but Marshall?—No, I have no doubt that it was used by others, but that was after Woodville's lymph was issued.

11,985. It was after Woodville's lymph was issued, but it was contemporaneously and concurrently with Woodville's lymph. Your point is, is it not, that from the moment of the introduction of Woodville's lymph all the cases are to be taken to be variolations and not vaccinations?—No, I do not say all, I say the majority.

11,986. How do you know it was the majority?—Because we have the records of those who inoculated with Woodville's lymph.

11,987. Was there any distinction found between the result of the variolous test in the undoubtedly vaccine cases and in the cases which you say were variolation? Take Marshall's cases. Marshall had some which you say were variolations, and some which you admit, were vaccinations; was there any difference resulting from the variolous test in the one set and in the other?—Professor Foster quoted all those cases as being examples of the variolous test put to cow-pox. Now when we come to analyse the cases we find that Marshall inoculated 296 with Woodville lymph, and 127 with the Kentish Town lymph, which he received after the Woodville lymph. Now referring to those 423 cases he says that 211 of them were tested, but every one resisted; those 211 may all have been out of the 296, we cannot say.

11,988. Unless he were purposely making a difference do you think it is very probable, when he records this account of his results of vaccination, that the 211 would all chance to be out of the 296, and not a proportion of them out of the others? Does not that look rather like reasoning to support a theory, than reasoning from what is the probability?—Not at all. We have this Woodville lymph used by Marshall in 296 cases, and Marshall may have tested the first 211 cases amongst them, in which case they would have been all Woodville's lymph; on the other hand, he may not. Assuming that some of those cases were cow-pox, I indicated in an answer I gave you on the last occasion, that that might be looked upon as evidence of a transient antagonism to variolous inoculation.

11,989. What is your point, exactly? According to your view, if the variolous test were used during the time of the transient antagonism the result would be the same whether it was transient antagonism or permanent effect?—Yes, as regards failure to inoculate.

11,990. Then, what is the importance of it? I understood that the importance of finding out whether it was Woodville or some other lymph was as to the proof afforded by the variolous test; but, if according to your view the variolous test would produce the same result whether it was vaccine matter or whether it was Woodville's variolous matter, how does all this concern us?—It is of great importance because, if, as Sir John Simon would have you believe, those 400 cases of Woodville's were cases of cow-pox, that would be overwhelming evidence of cow-pox affording protection against small-pox.

11,991. But in your view if all those 400 cases had been cases of undoubted vaccine they would have withstood the variolous test in precisely the same way?—No. I was careful to say that Marshall's cases were doubtful, and cases which we know for certain were cow-pox took small-pox by inoculation.

11,992. I am dealing with what I understood to be your theory that there was a transient antagonism between vaccine and small-pox, so that there will be a transient period of protection. Then I would ask you if the variolous test is tried within the transient period would not the result be the same whether there had been vaccination or variolation?—I said there *might* be; that is where the evidence is conflicting. I said there was evidence both ways with regard to cow-pox, and that I was bound to admit that although there were cases of variolation success after cow-pox there was also evidence to show that variolation did not always succeed; therefore, as an impartial witness, I was willing to admit that there may be a transient antagonism. If all Woodville's cases were swept in there would be no doubt about it. I have pointed out that not all the cow-pox cases stood the variolous test.

11,993. In your view would all the cases of variolation stand the variolous test; do you say that previous inoculation is an absolute protection?—Almost absolute, judging especially from Woodville's cases.

11,994. Do you say quite absolute?—There are always cases of individual peculiarity.

11,995. (*Dr. Collins.*) With reference to protection does that answer apply to the inoculated variolous test or to epidemic small-pox, or do you draw no distinction between the two? I understood you to answer his Lordship that except in certain peculiar instances variolation did afford protection against small-pox; do you include in that answer protection against epidemic small-pox as being on all fours with the variolous test?—No, I do not, because the variolation that was applied was the Suttonian, the mildest form of small-pox, and I should not compare inoculation of mild small-pox with the much severer test of epidemic small-pox.

11,996. (*Dr. Bristowe.*) Is there any evidence to bear that out?—There is the evidence of the general law of viruses, and the evidence I pointed out on a previous occasion that during the Suttonian period there was a vast increase in the number of cases of small-pox after small-pox.

11,997. (*Sir William Savory.*) This is your answer to Question 11,849 on the last occasion: "That for a period of perhaps two or three years, small-pox, that is to say, by the test of inoculation, will not take after an attack of cow-pox"?—Yes; and then in answer to Question 11,852 you will find I take the matter up again and say: "Looking at it impartially I think there is certainly evidence that might lead one to suppose that no effect was produced. On the other hand, there is a good deal of evidence which would lead one to believe, having a perfectly open and impartial mind upon the subject, that there may be a transient antagonism."

11,998. Are we to understand that you have not a definite view upon the subject or that you have?—Judging simply from the historical evidence, especially of the early inoculations, I do not not think I can say that it is absolutely proved that there is a transient antagonism to inoculated small-pox, though I am inclined to believe it myself; one finds cases which we know to be cow-pox, which when tested took small-pox; we find other cases tested, as in one or two cases by Ceely which did not succeed, but when we look at Woodville's cases of variolation we find a very different result, for none of them took when tested.

11,999. (*Chairman.*) In your view are all those cases of Marshall's either Woodville's lymph or from the London cow. I understand your view to be that 127 were from the London cow, and the rest from the Woodville lymph?—That is so.

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- 12,000. At page 257 of Volume II. of your book you quote : "I should have observed, that of the patients I inoculated and enumerated in my letter, 127 were infected with the matter you sent me from the London cow. I discovered no dissimilarity of symptoms in these cases, from those which I inoculated from matter procured in this county." That can hardly refer to Woodville's lymph?—Now we come to the controversy, and I will read this statement. It also bears upon a previous question as to whether practitioners were vaccinating without Jenner's knowledge. This is Woodville in his "Observations on the Cow-pox" in 1800 : "From the manner in which Dr. Jenner has referred to the inoculations conducted by him during the years 1797, 1798, and 1799, the reader may be led to infer that his experience had been sufficiently extensive to equal mine. But it appears from his publication in the summer of 1798 that *his practice had not then extended to more than eight cases and no opportunity to inoculate the cow-pox was offered to him again till he obtained from me matter for the purpose in February 1799.*" If that had not been true Jenner would have answered it; there can be no question about that. "This virus, however, which Dr. Jenner from his own experience declared to be so perfectly pure and genuine, was taken from the arm of an hospital patient who had 310 pustules, all of which suppurated. I have the evidence of Dr. Marshall who procured some of it from the persons inoculated by Dr. Jenner, and in the course of five weeks extended its effects in Gloucestershire to 107 persons, all of whom underwent the inoculation in the most favourable manner, nor did any pustules that suppurated appear in a single instance." That answers a question that I was asked on the last occasion as to evidence of Marshall getting his lymph from Pearson. Dr. Bristowe said that was only my statement. It is not only my statement; there is the evidence.
- 12,001. (*Chairman.*) But Woodville said he had heard from Marshall that 107 cases had been dealt with?—Yes; and Woodville's letter agrees with Jenner's own statement.
- 12,002. And there is Marshall's statement that he had inoculated with some matter he had taken in the county?—He says : "procured in the county." Procured from Jenner and by him from Woodville. Your Lordship is not the first, and Professor Foster is not the first, who has been misled in reference to that passage in Marshall's publication. Woodville says : "Dr. Jenner in his last publication has given a transcript of a great part of Dr. Marshall's letter, in which the above 107 cases are stated; but he does not represent these cases as the effect of the vaccine matter sent by me from the hospital; on the contrary, he professes to lay Dr. Marshall's communication before his readers to show the result of the inoculation in particular with the matter which he procured from a cow at Mr. Clark's farm at Kentish Town." Woodville, after alluding to this as a very striking misrepresentation arising from inadvertency, quotes Jenner:—
- 12,003. Is Woodville there referring to this paper of Jenner in which he quotes Marshall?—Yes.
- 12,004. That seems hardly a fair criticism after all, because he does not represent that all of them were from the London cow?—From the London cow or the source in the county; and thus, as Woodville says, he misleads the reader just as he has led your Lordship to believe, that there was a London cow and a county cow.
- 12,005. I confess that you have not yet satisfied me that there is not?—Jenner in his next publication, at the end of his second pamphlet, admits that these Marshall cases were inoculated with the Woodville variola vaccine; that was the lymph from the "county cow."
- 12,006. Does he admit that Marshall inoculated none except from the London cow and Woodville lymph, and if so, where?—Yes. At the end of his second publication he gives the cases of Stephen Jenner and Hill, and from Hill matter was taken for Marshall.
- 12,007. That is perfectly true, but Marshall may have made use of lymph from more than one source—from Woodville, from the London cow, and from the country cow; what is the evidence that he may not have done that?—Marshall's own letter. He gives you 423 cases; he gives the number himself as 127 from the London cow, and 297 with the Woodville lymph.
- 12,008. Does he say that he inoculated 297 from the Woodville lymph; how does Woodville get his 107 cases, which he attributes to Marshall, in the first letter; they were both published together at first?—No. Jenner left out the date of the second letter, which is a very important point. There was a notorious controversy. I have previously given you the pedigree of that lymph, and we know that from March 22nd to April 27th Marshall had inoculated 107 with Woodville lymph. By September 8th, 1799, he had inoculated 189 more, making in all 296.
- 12,009. Where is your authority that the 189 cases were with Woodville's lymph?—Marshall's own second letter; he says he only used two lymphs, and he only inoculated 127 with the Kentish Town lymph.
- 12,010. Where does he say he only used two lymphs?—In his letter. He puts them all together in his letter. Down to the date of his second letter he inoculated 423, and when he comes to his postscript he differentiates out of those, 127 infected with matter from the London cow; as to the rest he says nothing, but he says "I discovered no dissimilarity of symptoms in these cases, from those which I inoculated from matter procured in this county." I repeat that the matter "procured in this county" was not from a county cow, but from patients inoculated in the county by Jenner with Woodville's lymph.
- 12,011. I should infer from that that he had inoculated from three sources; some from the London cow, some from matter procured in the country, and some from Woodville lymph; and the object of the postscript is to point out that as between those who had been inoculated from the London cow and the country cow he had observed no distinction?—That is the point for which Jenner was severely criticised, that he allowed his readers to conclude that Woodville's lymph which had been sent him was "procured in the county."
- 12,012. It may be that he was open to criticism for not having admitted that some of it was Woodville; and it may be that Woodville went much beyond what was just in assuming that it was all his?—Woodville writes again, and says that "of the 423 inoculations brought forward by him" (Jenner) "to show the advantages of the vaccine virus as used by Dr. Marshall, 296 were performed with the matter sent from the hospital," and that was not denied.
- 12,013. Did Marshall write any reply to that at all?—Yes, Marshall responded because Woodville said he had heard from Marshall. Baron, in his Life of Jenner, accepts the account I have given as accurate.
- 12,014. Is there anything to show the dates at which Marshall had the Woodville lymph, and the lymph from the London cow?—Yes, I have given the dates.
- 12,015. I think you gave us the date of the London cow. I do not know whether you gave the date when he had the Woodville lymph?—It was sent on February 15th, 1799; it was sent to Jenner upon that date, and used by Marshall from March 22nd to April 27th.
- 12,016. When did he get the other?—In April 1799, but there is a little doubt about that, at any rate, by September 8th, 1799, he had inoculated 127 cases.
- 12,017. Then, apparently, he began to inoculate with the one very soon after the other?—Yes.
- 12,018. Would not that render it improbable that his variolous test was tried exclusively, or almost exclusively, upon those first inoculated?—Possibly; but I was going to say that we must not attach too much, if any, importance to Marshall's work; he was, although a friend of Jenner's, yet the same Marshall who was described by Moore, who wrote the "History of Vaccination" (page 264), as an eccentric man who, with John Walker, a "travelling preacher" . . . "procured medical diplomas from the indulgent University of Leyden; and, being low in fame and pocket made application to Dr. Jenner and obtained his sanction for a very useful project. By an application to the Admiralty he got them a passage in a frigate, and they proceeded to Gibraltar, Minorca, and Malta, teaching and practising vaccination in the Mediterranean."
- 12,019. (*Dr. Bristowe.*) A large number of practitioners at that period had no diplomas, they were not required?—Yes, but from Moore's statement I should not attach any scientific importance to Marshall's cases.
- 12,020. (*Chairman.*) Was Moore intending to cast credit or discredit upon Marshall, or was he indifferent?—Indifferent: this is a "History of Vaccination." Moore was a very ardent vaccinator, but he does not say very much for Joseph Marshall. He is the same man who is referred to as at Palermo employing a priest carrying a cross, and so persuading the people to be vaccinated:



"By these popular means it met not with opposition, and the common people expressed themselves certain that it was a blessing sent from heaven, though discovered by one heretic and practised by another."

12,021. Now I should like to ask you with regard to the question of Woodville's lymph. Woodville's patients, who appeared to be in some cases suffering from small-pox which may have been caught in the Hospital, may also have had cow-pox, may they not; the two diseases do sometimes run together, do they not?—That is possibly one explanation, as I have admitted; but I do not believe it.

12,022. Is it not conceivable, therefore, that in the case of the vacciner showing unquestionable symptoms of small-pox you might, at certain stages, get vaccine matter which would be true cow-pox and not variolous?—It is possible.

12,023. (*Sir James Paget.*) Are we not shown by many experiments in the earlier times, when they had at the same time vaccinated and variolated, that each vesicle conveyed its own disease?—Quite so; but those 400 cases of Woodville were not each one inoculated direct from the cow, the lymph was carried on from person to person, and it must have been either a mixture all through of small-pox and cow-pox or not a mixture; that is to say, pure small-pox.

12,024. (*Chairman.*) But taking Marshall's cases there is not the slightest distinction made by him, whether they were all from Woodville lymph or true cow-pox; supposing all the cases were from Woodville lymph then it comes to this, that in several hundred cases there was no distinction between Woodville's lymph and true cow-pox. Now, is it not true that although it may have been taken from a variolous patient yet nevertheless such lymph from that patient as went to Marshall may have been cow-pox and not variolous?—That is assuming that by some extraordinary process the small-pox ceases.

12,025. I ask, do you or do you not admit that a person may have at the same time cow-pox and small-pox?—Yes.

12,026. That is to say, that although a patient has contracted small-pox you may have inoculated vaccine matter and that it may be a true case of vaccination as well; do you admit that?—Yes.

12,027. Then in a case where there is true vaccination and at the same time undoubted small-pox, is it not possible that you might obtain vaccine matter which would be true vaccine matter and in no respect variolous?—It is possible.

12,028. Supposing that to be possible, is it not possible, therefore, that all Marshall's cases though taken from the patient you have described were cases of vaccination and not variolation?—It is possible, but he says that in one or two cases there were eruptions.

12,029. Supposing that he is correct in the statement that there was no dissimilarity in the symptoms between the cases of undoubted vaccination, that is to say, cases from the London cow and the nearly 300 cases from what you say was the Woodville lymph, would not that tend to show that what was possible had actually taken place, rather than that using variolous matter in nearly 300 cases there were no variolous symptoms?—Yes, it would if we had not the evidence of Adams, Guillou and others, evidence to show that you can obtain from variola a vesicle which cannot be distinguished from the vaccine vesicle.

12,030. Supposing both are possible, why should it be the one rather than the other. You admit it is possible it might have taken place if it were a case of variolation, and you admit that it might take place if it were a case of vaccination; why should we take it to be rather one than the other?—My view is that the number of Woodville's cases with pustules gradually diminished, and I am inclined to think the attenuation went on until he had obtained a vesicle which could not be distinguished from transmitted cow-pox. I admit that the other view is possible. When Woodville went over to France he admitted that he took lymph with him which produced variolous pustules. In a very short time he inoculated 6,000 children and after a time we hear no more of any eruptions; and that lymph continued to be used down to 1836 to Bousquet's time. The view I am inclined to take of that is, that the lymph was gradually shorn of its variolous character and of its pustules and gradually arrived at a condition in which it

produced phenomena similar to the phenomena exhibited by vaccination with cow-pox.

12,031. (*Dr. Collins.*) Referring to Marshall's cases, he got his lymph from Jenner in March 1799, did he not?—Yes; Jenner had received it February 15th, 1799.

12,032. But the only supply of Woodville lymph that Marshall had was through Jenner, was it not?—Yes.

12,033. From the arm of Hill?—Yes.

12,034. Prior to Marshall receiving that lymph it had been transmitted through Stephen Jenner and James Hill?—Yes.

12,035. The inoculation of Stephen Jenner, I think, produced some vivid red spots upon the body, which Jenner afterwards described as pustules which did not mature?—Yes, I have explained that in the pedigree of the lymph, which I have handed in, but it is very difficult in such a controversy to remember all the details. My belief that this lymph sent to Marshall was Woodville's small-pox lymph is supported by Jenner's first two inoculations. Jenner inoculated Stephen Jenner and James Hill. Stephen Jenner showed spots on the arm, three on the face; in James Hill the vesicle assumed "more perfectly the variolous character than is common with the cow-pox at this stage." So that, taking all this into consideration, together with the results produced by the lymph when it was sent to other practitioners, I am bound to say that I conclude that it was variolous lymph.

12,036. (*Professor Michael Foster.*) I understood you to say in reply to Dr. Collins that Jenner sent Woodville lymph to Marshall. Where is the record of Jenner sending Woodville lymph to Marshall?—Yes, he procured it from that source.

12,037. It is a matter of inference only?—Not that Marshall's lymph was derived from that source, there is Baron's evidence of that.

12,038. (*Chairman.*) Is there any direct evidence showing that the lymph was supplied from the same source, that is to say, the same vacciner, as that which Jenner had in the two cases you have alluded to?—Yes, because Marshall was Jenner's neighbour, and there is no doubt that Marshall got his supply of it from Jenner.

12,039. (*Dr. Collins.*) Had Jenner any other lymph than Woodville's in February and March 1799, when Marshall wrote to him that he was happy to be informed that he could procure matter from some whom Jenner had inoculated?—No, there was no other source.

12,040. Jenner had recently been performing vaccinations upon the children of Mr. Hicks, who lived at Eastington, where Marshall resided?—Yes. Then there is one other point which can be briefly disposed of now. I have apparently given two conflicting accounts in my book, and have allowed the matter to stand, and your Lordship asked me if there were two Mr. Hicks each with two children. I gave the accounts as I found them perfectly accurately, and I allowed them to stand. I did not go into the disputed point.

12,041. (*Chairman.*) The point is capable of a variety of explanations. It may be that in Baron's Life the mention of the Hickses as being the persons upon whom the vaccine matter was used was a mistake, and that the Hickses were persons who had been vaccinated at a subsequent time with other lymph. There are a variety of explanations which are possible?—I should only like to direct attention to the fact that I have given an accurate account of the statements on record.

12,042. But you do not call attention to the fact that there appears to be some discrepancy or mistake upon this point?—I do; I say in my book after giving the first account, "I shall refer to this matter again."

12,043. What is the next point to which you wish to call the attention of the Commission?—I should like now to put in Pearson's own statement, which bears out all the statements I have given with regard to this very question.

12,044. What do you extract it from?—From Pearson's "Examination of the Report," published in 1802, page 43; it reviews the condition of affairs and bears out what I have said. It also answers one or two of the questions that were put to me with regard to the way in which Pearson worked with Woodville in sending out lymph. This is what Pearson says: "From the time of the above publication in June 1798 the author" [Jenner] "contributed no further inoculated cases to the end of that year; nor could I do more than investigate the history of the cow-pox principally by

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"inquiries among provincial physicians and farmers, from whom I was enabled to confirm some of the facts in Dr. Jenner's book, and to render doubtful or disprove others, and to bring to light new observations. Vaccine matter was in vain inquired for, and Dr. Jenner had discontinued the inoculation about the time of publishing his book above mentioned. But from the curiosity excited by my inquiries among the milk farmers near London, as appears from the inquiry into the cow-pox which I published, but principally owing to the attention of Dr. Woodville, information was communicated in January 1799 that the cow-pox was epizootic in Gray's Inn Lane; and at the same time I received the agreeable intelligence that this disease was also raging in the largest stock of cows on the New Road near Paddington to which no one could gain admittance but myself. With vaccine matter procured from these sources Dr. Woodville instituted the trials of the new inoculation in the Small-pox Hospital, and I carried on mine in certain situations instead of the small-pox, and among such persons as I induced to undergo the experiment; besides, we promoted the practice by furnishing Dr. Jenner, of Berkeley, and other practitioners with London vaccine matter for the repetition of the cow-pock inoculation in Gloucestershire and other places. In about two months, to wit, by the month of March, we had inoculated upwards of 160 persons, which was about 20 times the number inoculated at any former period by any one inoculator. And I issued the following printed letter dated March 12th, 1799, among more than 200 practitioners of the United Kingdom to report the progress of the new inoculation with enclosed thread impregnated with vaccine matter."

12,045. (*Chairman.*) I think Bumpus was the name of the patient from whom you said that Jenner's lymph was derived?—Yes.

12,046. And Marshall's too?—Yes.

12,047. Bumpus was in the Hospital, was not she?—Yes, the name was Ann Bumpus.

12,048. I see that from Bumpus, of patients whom he describes, he vaccinated five; one of those having a considerable number of pustules was Dixon; do you know whether Dixon was in the Hospital, because four out of the five he vaccinated from Bumpus had no pustules at all; if so, it is possible, is it not, that it might have been true vaccination in the case of all those who were vaccinated from Bumpus, only that Dixon, if he were in the Hospital, may have contracted small-pox?—One must compare that case with the cases where Woodville's lymph was used in the country; there was no small-pox in the neighbourhood, though there was the same pustular eruption; I am speaking of Harrup's, Evans', and Ward's cases.

12,049. May it not have been that he may have got some true vaccine matter uncontaminated with variolous matter, which may have gone into some quarters; although in others, owing to the patients having gone to the Small-Pox Hospital, the vaccine matter may have been contaminated with variolous matter?—That is possible.

12,050. (*Dr. Collins.*) Is it stated anywhere that Ann Bumpus was a patient in the Hospital?—I cannot recollect without reference.

12,051. (*Chairman.*) Did Woodville inoculate anywhere except at the Hospital?—I have no record as to that; Pearson inoculated some private patients.

12,052. (*Dr. Collins.*) Have you put into your evidence the letter which Pearson sent out with his lymph?—Yes, that is in evidence. And going to the British Museum recently I have found further evidence of groups of cases of variola in the country resulting from vaccination with variola-vaccine; so that even the list I have given in evidence is not exhaustive.

12,053. (*Chairman.*) As far as I can see, in Woodville's table he only gives five cases from Bumpus; Dixon, Walker, Cummins, Ellistone, and Dunn. In those five there were no pustules except in the case of Dixon, and I do not see that he vaccinated any persons from those who had been vaccinated from Bumpus except from Dixon; he vaccinated from Dixon?—Yes, from Dixon he vaccinated six.

12,054. Of those six, two displayed a considerable number of pustules; but from the four vaccinated from Bumpus who had no pustules I do not see that there was anybody vaccinated. Of course, if Dixon himself had contracted small-pox that would prove nothing about lymph taken

from Bumpus, and except the vaccination from Dixon I do not see that there are any other vaccinations traceable to Bumpus in Woodville's list?—You have Stephen Jenner and James Hill; Stephen Jenner was inoculated with lymph from Bumpus's arm, and Stephen Jenner had pustules, and James Hill had a vesicle which Jenner says was more like variola than he had ever seen in cow-pox.

12,055. (*Professor Michael Foster.*) The date of the appearance in Dixon's case is opposed to the view that those pustules were the result of inoculation of small-pox, coming out as they did so late?—It may have been delayed by the concurrent vaccination.

12,056. (*Chairman.*) By the concurrent vaccination, yes, but the question of contamination depends upon whether there was any vaccination at all; whether the whole result did not arise from what was merely called vaccination; if you admit there was vaccination that settles the whole question?—Take the case of Ann Bumpus, the lymph with which she was inoculated was taken from Sarah Butcher, who had no pustules. What is opposed to the argument that it was small-pox superadded, owing to the variolous condition of the Hospital is the evidence from the country; Harrup's, Evans', and Ward's, and all the cases inoculated in the Duke of Clarence's family where there was no small-pox in the village, and yet those patients had small-pox.

12,057. Would not that all be reconciled by supposing that some of the lymph sent out by Woodville was true vaccine, and that other of the lymph was contaminated by variolous matter; would not that reconcile the whole matter?—No; I do not think it would reconcile those cases where variolous pustules cropped up after inoculation with lymph from a local vesicle.

12,058. (*Sir James Paget.*) Are you sure that they were careful at that day to see that there was no contamination of the lymph sent out?—No.

12,059. Should we be content at the present time to take no more care than Woodville took, probably vaccinating with the same lancet with which he variolated?—No, certainly not.

12,060. Supposing they were vaccinating with an unclean lancet. Do you think those observations were made with care enough for us to be able exactly to interpret the results?—The important result to be interpreted is that in all those cases at all events with pustules, and in those cases with the local vesicle which subsequently gave rise to pustules the variolous test was vitiated.

12,061. But in a large number of Woodville's cases it was only a vesicle?—I have already stated so.

12,062. You adhere to your view that a very large number of persons who were vaccinated in England in the first few years were vaccinated from a material which was practically variola?—Yes, I look upon Woodville's cases as a far more extensive series but similar to Adam's cases.

12,063. Would you deny that there may have been cases from Woodville's own lymph which were cases simply of vaccination?—There may have been some cases, but it seems to me that his lymph was variolated from the very first; it is not as though he was getting a fresh stock from the cow for every case. If your lymph is contaminated to start with how can you separate it afterwards?

12,064. (*Chairman.*) I wish to call your attention to the first vaccinations from the cow; there were seven cases; out of those there were only three without pustules, two having a considerable number of pustules. In those cases must not the small-pox have intervened from some other cause, or do you suggest that those cases of pustules were vaccine pustules?—I think, as I have already said (Pearson suggested it afterwards), that from the very first instance Woodville used a variolous lancet; that is to say, he took a variolous lancet with him to get the lymph from the cow. I think if you refer to that very case of Mary Payne you will see that, although there were no pustules, still Woodville points out how closely the vesicles resembled the variolous inoculation; and in the third case, on describing the infection of the arm, he says the appearances were "more analogous to those of the inoculated small-pox than in the case of Mary Payne."

12,065. (*Professor Michael Foster.*) Have we any experience of what would be the result of a series of inoculations upon a human subject of the virus of small-pox and of vaccine combined or mixed together?—I



think Willan gives some experiments of persons vaccinated and variolated at the same spot.

12,066. You begin by inoculating a spot with vaccine and variola, and then you get a vesicle or a pustule, call it which you will; you may suppose that the new pustule contains both vaccine virus and variola virus. You take some of the contents of that pustule, and you inoculate that into a second subject, and in doing so you may suppose that you will a second time carry the two viruses together. Suppose you do that in succession several times, have we any facts which will enable us to answer the question as to what the result will be?—No, Willan gives one case, I think.

12,067. We know what the result is on animals, do we not; you know Chauveau's experiments in that direction?—Yes, I know what you refer to, successive inoculations from the pustule, which was obtained by inoculating a mixture of variola and vaccine. In the end Chauveau found only vaccine in the case of the cow.

12,068. In the case of the cow the struggle between the two viruses ends in the destruction of the small-pox?—Chauveau thought so, but variolation of the cow may fail in an enormous per-centage of cases at the very first attempt.

12,069. The variola in the cow mixed with the vaccine gives a vesicle. When that is carried on for several generations there is no sign of any variola virus being contained in the vesicle?—I should doubt whether there was even in the first case.

12,070. The first case gives variola?—I should doubt that very much.

12,071. Variola inoculated into the cow gives a papule material from which gives variola when inoculated into the human subject; there is no doubt about that, is there?—It has been doubted when no variolous vesicle formed; it has been suggested that the material was simply mechanically transferred.

12,072. Do you know the disproof of that?—I was not aware of any disproof of that.

12,073. And that when the papule does not appear a scraping from the part does not convey variola?—I was not aware that that experiment had been performed. It is a very important piece of evidence.

12,074. (*Dr. Collins.*) I suppose in the case of a particular cow which had been both variolated and vaccinated, in which the vaccine succeeded, it would be very difficult to say whether the variola had been effective at all, would it not?—Yes, and in cases where you have inoculated with cow-pox and variola and produced a vesicle, it would be difficult to decide whether the vesicle was due to the variola or to the cow-pox.

12,075. (*Professor Michael Foster.*) We have no corresponding cases in the human subject, have we, where one can readily recognise the marked effect of the variola?—No. If you inoculate variolous and vaccine matter, and produce a vesicle, to say that that is a vaccine vesicle and nothing else, is assuming too much. It may be simply a variolous vesicle.

12,076. Or it may be a mixture of both?—Yes; so that I do not think we learn anything from it anyway.

12,077. I want to know what would be the effect of the successive cultivation of that mixed vesicle; have we any evidence as to that?—We have not. I do not recollect any experiments at all in that direction.

12,078. (*Dr. Collins.*) It was put to you on a former occasion whether the evidence produced by Ward, Harrup, Ring, and others of eruptions on the body following the use of Woodville lymph might not be explained by the fact that those publications were of exceptional cases. I wish to ask you whether there is any evidence of that being so, or whether it is not more probable from Woodville's publication and Pearson's letter that those who used the lymph might reasonably have expected eruptions?—Yes, at the early stage, but later on the pustules diminished. I should like to give a quotation from Jenner where he says he found that in his hands, as well as in the hands of others, the pustules had gradually diminished until they disappeared altogether; that is what occurred in Adams' cases of attenuated small-pox of which I gave the details. (*See Question 11,141.*)

12,079. (*Chairman.*) But at such an early time as the date of this "Continuation of facts and observations" by Jenner, he states that he "cannot feel disposed to imagine that eruptions, similar to those described by Dr. Woodville, have ever been produced by the pure, un-

"contaminated cow-pock virus." [*Crookshank, Volume II., page 252.*] So that he speaks of the appearance of these variolous pustules as rather confined to Woodville, and points out, upon the authority of Marshall, that the same thing cannot be seen in the country; it may be a mistake, but is there any ground for the statement that of the cases vaccinated with Woodville's lymph the normal condition was to exhibit these variolous pustules. It is not proved merely because in particular cases recorded by particular observers there were such pustules. There were, as you say, a number of people trying experiments; is it not quite possible that these cases may have been recorded as fully, or more fully, than the others, and yet may have been exceptional?—Some of the cases were simply published as experience of the Woodville lymph; other practitioners did not know there was anything extraordinary in those cases, they had no knowledge of cow-pox; they did not know that it was not an infectious, eruptive disease, and therefore would not see any reason for publishing their cases.

12,080. But your notion is that after Woodville issuing this lymph there would be 20,000 cases of vaccination; is there any evidence of variolous pustules in any considerable proportion of that 20,000?—No; I think the lymph rapidly became so attenuated that it only produced a local vesicle, but I have certainly been astonished lately at finding further accounts on tracing Woodville's lymph. I rather desisted from giving Jenner's own quotations about it, because I thought it better to give independent evidence. Woodville himself points out in his cases the number with pustules, and Jenner says himself that the number of pustules was diminishing. If it was getting more like Adams' variola vaccine I should expect the lymph to cease to produce pustules.

12,081. (*Dr. Collins.*) Is there any other observer besides Marshall who used lymph prior to 1801 who found conversely that there were never pustules following the use of the Woodville lymph?—I could not say.

12,082. Does not Pearson in sending out lymph to the 200 practitioners say that in many cases eruptions upon the body appeared, some of which could not be distinguished from small-pox?—He does, and you will find that already in my evidence.

12,083. In quoting the cases of Ward, Harrup, Ring, and others, were you led to think from the statements concerning them that those were regarded then as exceptional cases of Woodville lymph, or were those all the cases you could find?—They were all I could find. Some were regarded as exceptional. Blair, for instance, wrote, saying, "Either cow-pox is an infectious disorder or there is some fallacy in the experiments in London;" the others were only giving their experience and publishing the results of the variolous test afterwards, publishing them as proof of the efficacy of vaccination against small-pox.

12,084. (*Sir James Paget.*) Were there any of them more than six months after vaccination?—Not so much, I think.

12,085. So that they are not a very complete test?—That is one fault I have to find with the variolous test all along.

12,086. (*Chairman.*) That it does not show the length of time for which vaccination is protective even if it is protective?—Yes, exactly.

12,087. (*Dr. Collins.*) The difficulty is to find in these early cases, undoubted cases of cow-pox uncontaminated by small-pox, which were put to the variolous test?—Yes; I have not been able to find a series of cases of which I could say definitely, these are cases of horse-pox, or these are cases of cow-pox, which have been put to the test. There were a few isolated cases of cow-pox like the Stonehouse cases which were put to the test, and the results were very unsatisfactory.

12,088. (*Professor Michael Foster.*) In some of the Colborne cases there was protection after vaccination with cow-pox: subsequent inoculation with variola failed?—Yes; the test was applied only a few days after vaccination, and I would class such cases together with Marshall's, as cases which lead me to admit the possibility of a transient antagonism.

12,089. (*Dr. Collins.*) Do you think that for such purpose those cases of Woodville's must be set aside?—Yes.

12,090. (*Sir James Paget.*) I think Willan gives us an account of cases at the Foundling Hospital and elsewhere inoculated a year or two after vaccination

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without result; are we to assume that the whole of those were vaccinated with Woodville's lymph?—As I said before it does not satisfy me as a pathologist to say from Willan's cases that it is proved that either cow-pox or horse-pox protects when we have no shadow of evidence to show that either cow-pox or horse-pox was used.

12,091. Take the cases of vaccination from a cow carried on one remove after another; is there no evidence that such vaccination has protected?—There is a mere handful of cases in which the variolous test was applied after the discovery of those stocks of lymph. I was anxious to refer to this question, because this is what Sir James Paget has also said in Questions 11,789 and 11,794, namely, that vaccine lymph was put to the test in France and other countries. Now, taking first of all the question of testing stocks of lymph, Woodville took his lymph to France; so there, again, is a fallacy; and to Vienna, too, Pearson sent the lymph. The Vienna tests were made upon the Pearson-Woodville lymph. The experiments were very meagre. You will find them referred to in Baron, Volume I., page 335, in a letter from Dr. De Carro to Jenner, dated 14th September 1799, I hoped I might get some light from that. He says, "Three months afterwards these three children have been inoculated with variolous matter, without any effect whatever." Then I find that was lymph on two threads sent from Dr. Pearson. To complete this point I would say that with regard to the various stocks of either cow-pox or horse-pox lymph being over and over again tested, I must say no, to Sir James Paget's answer "Surely, yes." I have sought through volumes of papers and have been unable to find evidence of each individual stock being tested. There were stocks introduced by Leese, Estlin, and Ceely, and in only one or two instances was the test applied. I am not aware of any evidence that the Beaugency lymph, the Passy lymph, or any of the numerous stocks raised in Wirtemberg were put to the variolous test; nor have any of the numerous stocks obtained since 1840 from both horses and cows been tested, for the simple reason that small-pox inoculation was then an offence. None of the numerous stocks raised at Bordeaux, Montpellier, and elsewhere from outbreaks of cow-pox or horse-pox were tested and none of Layet's and Peuch's equine stocks were tested; nor was the stock recently raised in this country from the so-called Alderley cow tested by variolous inoculation. Some observers say that they "tested" the lymph and were satisfied of the protective power; but, on going into that, I find the test was either re-vaccination or the correctness of the vesicle; if the lymph, whether derived from the horse or the cow, produced a correct vesicle it was said to have been "tested." Then, with reference to Dr. Willan's cases, I have gone carefully into them, but I can find no evidence that it was either cow-pox or horse-pox, and that is necessary to satisfy the mind of a pathologist.

12,092. (*Chairman.*) You say that it is probable, or at least possible, that there may be a transient protection from vaccination; have you any evidence which would enable you to fix any time beyond which you think that it would not be protective, or within which you think it might be?—I think the evidence is very conflicting as to there being any protection at all; but in some cases it would seem that the antagonism might last (judging rather from the Musselburgh cases) as long as two or three years. On the other hand I find in some cases specific variola after six months.

12,093. If it is possible that it may be protective, is not the natural course to take in order to ascertain whether it is, or how long it is, an examination of the facts to see whether those who are vaccinated resist small-pox better or not than those who are unvaccinated? If it is once admitted that it may be protective, and that it is a question of time, is not the natural course to take in order to satisfy oneself, an investigation of the facts?—Quite so, but when we come down to recent times we have to deal with statistics, and those statistics do not differentiate the different stocks of lymph.

12,094. But apart from the question of the different stocks of lymph, when it is once admitted that it is possible that vaccination may afford protection, is not one then relegated to the question of fact to show whether experiment proves that it has done so? If experiment leads to the conclusion that the vaccinated resist small-pox to a greater extent than the unvaccinated, would not that be a sufficient basis for the scientific conclusion that vaccination was a protection, if you found that some protection lasted for very many years although it might be a diminished protection?—

Then it becomes a question of comparing the test of epidemic small-pox with the variolous test; for hitherto one has only been dealing with the variolous test.

12,095. I understood your position before to be that, that vaccination should afford protection was a pathological absurdity?—Specific protection.

12,096. Taking it that it is conceivable that it may afford protection is not the only means of arriving at a conclusion as to whether it does or not, an examination of the facts, of which we have now the records more or less complete extending over a considerable part of a century?—No doubt statistical facts are of importance.

12,097. Are they not—not only important, but when it is once admitted that it is a possibility are they not the only thing of importance. To inquire how far from experience there has been a protection of persons vaccinated as compared with those unvaccinated, is not that the only thing upon which to found a conclusion; is any rational conclusion possible until you have as far as possible exhausted that source of inquiry?—I do not for a moment question the importance of statistical evidence based upon facts.

12,098. (*Sir James Paget.*) For example, is it not true that the proportion of children attacked with small-pox after vaccination is less up to six or seven years than it is afterwards?—There you have conflicting evidence. There is affirmative evidence in some cases, and conflicting evidence in other cases. For instance, in the so-called varioloid outbreaks in Scotland in 1819, 1820, and 1822 —.

12,099. But take our own experience?—I want to put before you both sides of the evidence; you cannot eliminate all the evidence on one side or the other. There was a very considerable proportion of children attacked by small-pox. Dr. Gibson reported in his own practice I think it was 251 cases of small-pox, of which far the greatest number had been vaccinated less than two years.

12,100. (*Chairman.*) Have you made an exhaustive investigation of the statistics?—I have not dealt with them absolutely exhaustively because it is far too large a subject. I deal with the subject as far as possible as a pathologist.

12,101. As a pathologist when you pronounce the protection transient that must be determined by experiment, must it not; how can you determine it to be transient?—Patients after a few years took variola when inoculated. With so mild a test as that that is a very striking evidence of the protection being transient. I should not base conclusions altogether upon statistics because one knows how fallacious the conclusion may be.

12,102. At all events, supposing you found that, although vaccinated people might have taken the small-pox, yet that throughout the whole term of life, or at all events many years of life, the proportion of those who took the small-pox after vaccination was very much smaller than the proportion taking it who had not been vaccinated, would not that lead to the conclusion that vaccination was a protection not of so transient a character as you have suggested?—You mean under six years of age?

12,103. I am speaking of all, whether over that or under that age?—We have the experience of Layet that at six years old some 40 to 50 per cent. of the children he dealt with were susceptible to small-pox.

12,104. Why do you say that?—Because they were completely susceptible to re-vaccination.

12,105. What proof have you that a person susceptible to re-vaccination is completely divested of any protection against contracting small-pox; why is it impossible that there may still be some protection remaining although not enough to resist inoculation?—To my mind as a pathologist it is inconceivable that the immunity from cow-pox should have absolutely passed away against itself, and yet that there should be partial immunity left against small-pox.

12,106. (*Sir William Savory.*) Have you read Seaton's book?—Yes.

12,107. Do you remember what he says?—Yes, but we must remember that Dr. Seaton was very strongly prejudiced; he explains away all evidence contrary to orthodox views.

12,108. (*Chairman.*) You say that to you, as a pathologist, it is inconceivable. With all respect that does not carry conviction to my mind, because many things have been pronounced "inconceivable" from time to time by



exponents of various subjects which, nevertheless, one has seen realised; can you give any proof that such a thing cannot be, beyond merely the idea that it is inconceivable?—I should have thought that when re-vaccination was made compulsory in Germany the reason for making it compulsory was that the immunity from the first vaccination had passed off, and it must be admitted that in France all the vaccinators regard it as the test—if the immunity has completely passed off to the virus of cow-pox it has passed off to the much stronger virus of small-pox.

12,109. (*Sir James Paget.*) Is it not the fact that a great many people escaped small-pox who yet did not escape from the effects of inoculation; that small-pox succeeded in an enormous proportion of those inoculated, although a large number of them were perpetually in danger of contracting small-pox, but did not contract it?—Quite so; it does not follow that if people come into contact with small-pox cases they must necessarily catch it. Inoculation took in a far greater proportion because you deliberately introduce the virus in each individual case.

12,110. Is it not the same thing with re-vaccination, that you deliberately introduce the virus?—Yes, and the fact that the operation succeeds in the majority shows that the effects of the previous vaccination have passed off.

12,111. But the same thing might happen with people exposed to the infection of small-pox and not incurring it, who if inoculated for a second time would have taken the disease?—I cannot follow you in that assumption.

12,112. (*Chairman.*) Do you suppose that a person who has had the small-pox might not be able to resist taking the small-pox from ordinary sources of infection or contagion who yet might not resist variolation?—I should expect him to resist variolation, because at the end of the last century variolation was practised in such a mild form that people who had had small-pox would resist such a mild test.

12,113. (*Sir Guyer Hunter.*) In reply to Sir William Savory you spoke of Seaton having been a strong advocate of vaccination, implying that his opinion should be received with some reservation; would the same remark apply to those who are opposed to vaccination?—Unquestionably, but those conclusions which I have given with regard to re-vaccination are from authorities who are also the leading vaccinators; like Layet at Bordeaux, and the directors of vaccination at Montpellier and other places.

12,114. (*Chairman.*) But Layet did not find the same proportion of children of six, eight, and ten years taking re-vaccination as took primary vaccination, he found a very large per-centage, but it was not a per-centage anything like so large as of those who took the primary vaccination?—When you add the successes to the *fausse vaccine* it was not quite so large but very nearly.

12,115. But even adding them together, what would account for the difference there was unless there were some protection in the prior vaccine?—If upon a second test they had not taken that would be evidence of there being something protective remaining behind, unless the age makes the difference; I also gave Layet's figures in which upon a second attempt there was again a considerable number of successes. In fact, from reading Layet's works one would be led to believe that if you only vaccinate children often enough, and from different stocks of lymph, you could re-vaccinate them all with success.

12,116. (*Dr. Collins.*) Does not Layet show that in younger children the re-vaccination was, at any rate, not less successful than in the elder children?—He has experiments extending over several years; in the first year his per-centage of success was somewhere between 36 and 32 per cent.; then he gradually became more successful, until, in 1888, he got 50 per cent. of successes.

12,117. Did he not find in those he re-vaccinated at six years of age a rather higher, or equally high, per-centage of re-vaccination success as in those he re-vaccinated at the age of 10 or 11?—Yes.

12,118. Do you think it is possible that age, and the changes which occur with age, induced a lesser susceptibility to receive vaccination?—It is possible.

12,119. Do you accept with M. Layet that successful re-vaccination may be considered as indicating a relapse into susceptibility to small-pox?—I do.

12,120. You would think that to deny that would be inconsistent with the doctrine that "the vaccinated are

"safe from small-pox because they have in fact had it?—Yes.

12,121. Was that the doctrine that Seaton held?—Yes.

12,122. (*Sir William Savory.*) Have you anything to show that susceptibility to vaccination is affected by age?—The statements of M. Layet.

12,123. That is not evidence, is it?—I look upon the statement of an authority like M. Layet, although he may not give figures to support his conclusion, as important.

12,124. (*Chairman.*) My question was devoted to comparing, at different ages, re-vaccination with primary vaccination?—I understood that.

12,125. Do not his experiments show that at any of those ages with which he divides his tables, the already vaccinated took re-vaccination to a less extent than those who had not been vaccinated at all?—That is so.

12,126. How do you account for that, if the first vaccination had left nothing behind?—I think that infants in arms are more susceptible to vaccination than children.

12,127. But, comparing the children at those different ages, is it true that in any of those ages which he gives the re-vaccination succeeded in as large a number of cases as the primary vaccination?—I cannot say; I have not got his tables of primary vaccination at six years of age.

12,128. I thought you gave the Commission his primary vaccinations though perhaps not at each age?—I gave them for children and recruits.

12,129. You gave, I think, what M. Layet said was the result in the primary vaccination; but postponing that point, supposing that in the case of children re-vaccinated there is either insusceptibility, or modified appearance, as compared with children vaccinated for the first time, how would you account for that, supposing the primary vaccination had ceased to have any effect?—I do not know of any figures in that direction; but, assuming that to be the case, I should say that in those cases there may still be some traces of the action of the cow-pox.

12,130. At all events, you have not any view accounting for that, if that is the fact?—No.

12,131. Would you say the same thing if you found on experiment that the proportion susceptible was greater in the unvaccinated than in those already vaccinated, comparing the same age with the same age; that is to say, that at the same age the proportion of those in whom the vaccination took was greater if they had not already been vaccinated than if they had? Would you also in that case say that that pointed to the existence of some condition brought about by vaccination which had not lost its effect?—Yes, I should, if such figures exist and can be relied upon.

12,132. (*Professor Michael Foster.*) I asked you if you were aware of Dr. Cory's result; may I call attention to the answer he gave to a question of mine? There had been an answer to a previous question to the effect that in the great majority of cases he could tell from the character of the vaccination mark whether that vaccination was re-vaccination or primary vaccination, and I said to him, at Question 4748, "So that practically, 'absolutely successful re-vaccinations, as indicating 'that no trace has been left of the original vaccination, 'are extremely rare,' to which he answered, 'Extremely rare'?"—Yes, I know of Dr. Cory's statement, and it bears no relation to the experience of M. Layet. I am not aware that Dr. Cory has ever attempted to carry out a series of re-vaccinations at six years old; that is to say, to compare with Layet's 18,000 cases.

12,133. (*Dr. Collins.*) It might be that Dr. Cory's less success was owing to his re-vaccinations being at a later age?—Yes.

12,134. (*Sir William Savory.*) What does Layet say about the character of the scars in re-vaccination?—He notes the character of the scars, but does not go into that.

12,135. Or the character of the vesicles produced?—He describes the vesicles and figures them also.

12,136. What does he say?—That those in which they are perfectly successful cannot be distinguished from ordinary primary vaccination vesicles, and that the *fausse vaccine*, of which I will show you a plate, may vary from the appearance of simple irritation to a

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condition with difficulty distinguishable from that of "true" vaccine.

12,137. Then all that are successful are not perfectly successful?—Yes, because he eliminates those from the "successful."

12,138. (*Sir Guyer Hunter.*) What is the proportion of "perfectly successful" to the total amount of "successful" re-vaccinations?—About half.

12,139. One half of the re-vaccinations show vesicles which could not be distinguished from the primary ones?—Yes; about half.

12,140. (*Chairman.*) From six to seven years there were 38 per cent. of complete successes?—Yes; but in 1888, when his re-vaccinations of children had got up to 18,000, his per-centage of successes was 50 per cent.

12,141. (*Sir William Savory.*) How does he account for the remaining 50 per cent.?—He divides them all into three tables, "no success," "*fausse vaccine*," and "perfect success."

12,142. The "perfect success" you would put at 50 per cent.?—In his 1888 vaccinations he puts them at 50 per cent.

12,143. Do you remember what he puts his *fausse vaccine* at?—I do not remember. I have handed in the tables.

12,144. At all events there is only half the number in which the success is perfect?—Yes.

12,145. And half in which it is either a failure or is in some way modified?—Yes; then he tells us that when he re-vaccinates those in which he was previously unsuccessful, he gets upon the second attempt as much as 20 to 30 per cent.

12,146. (*Chairman.*) How many of those does he re-vaccinate more than once?—He does not give us the tables, but he lays it down as a rule that you must re-vaccinate every year those who failed to be re-vaccinated the year before.

12,147. (*Professor Michael Foster.*) That is to say the "totally failed"?—Yes.

12,148. But he would not re-vaccinate the "*fausse vaccine*"?—I could not say that, but I think he would.

12,149. Do you mean to say, after getting *fausse vaccine* upon one occasion, that upon the next occasion of vaccination he would get a complete success?—I could not say. I should imagine the *fausse vaccine* would have some effect.

There is just one point I should like to mention with regard to Question 11,852 when your Lordship asked me, "Your view is that there is simply a difference of opinion as to the length of time for which it operates to protect," to which I replied, "Looking at it impartially I think there is certainly evidence that might lead one to suppose that no effect was produced. On the other hand, there is a good deal of evidence which would lead one to believe, having a perfectly open and impartial mind upon the subject, that there may be a transient antagonism;" that is to say, to the variolous test. Then in Question 11,857 your Lordship added that I had written two very big volumes which did not give a ray of light upon that point. I should like to draw attention to a paragraph at page 99, Volume I., of my book, where I said in discussing the possible origin of the tradition: "It was evidently failure in attempting to inoculate small-pox on the arms of those who had recently contracted cow-pox, which gave rise to gossip among the dairy-maids, and laid the foundation of the popular tradition." I have also admitted that there are many cases, just as Pearson gave us a very interesting case; he inoculated a farmer with small-pox without effect, and the latter stated, "I have had the cow-pox lately to a violent degree, if that's any odds."

12,150. (*Chairman.*) I should not have understood that paragraph, reading on, to mean that that was anything more than an accident, because you say, "The dairy-folk could not be expected to distinguish between inoculated small-pox and small-pox caught in the natural way, and the fact that some cow-poxed milkers were proof against inoculation was so interpreted, as to afford a foundation for the popular belief that they were for ever after secured from the danger of catching the small-pox." I understand that certainly to mean that that was a mere accident which people misinterpreted?—I have always believed in the possibility of a transient antagonism to inoculated small-pox, and that that was the origin of the traditional belief in protection from epidemic small-pox.

Adjourned till Wednesday next at one o'clock.

## Fiftieth Day.

Wednesday, 3rd December 1890.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

SIR JAMES PAGET, Bart.  
SIR W. GUYER HUNTER, K.C.M.G., M.P.  
SIR EDWIN HENRY GALSORTHY.  
SIR WILLIAM SAVORY, Bart.  
MR. CHARLES BRADLAUGH, M.P.  
DR. JOHN SYER BRISTOWE.

DR. WILLIAM JOB COLLINS.  
PROFESSOR MICHAEL FOSTER.  
MR. JONATHAN HUTCHINSON.  
MR. J. ALLANSON PICTON, M.P.  
MR. SAMUEL WHITREAD, M.P.  
MR. F. MEADOWS WHITE, Q.C.

MR. BRET INCE, *Secretary*.

*Prof. E. M. Crookshank, M.B.*  
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Professor EDGAR MARCH CROOKSHANK, M.B., further examined.

12,151. (*Chairman.*) I wish to ask you if you have any observations to make as regards the evidence you have given and the inferences you have drawn on the subject of the susceptibility to re-vaccination as indicating susceptibility to small-pox? Have you any observations to make with regard to the table which is exhibited in Dr. Seaton's "Handbook of Vaccination" comparing the susceptibility to vaccination after small-pox and to re-vaccination?—No, I have not.

12,152. You have not gone into that subject at all, perhaps. I ask the question because he exhibits a table which shows approximately that the successful vaccination after small-pox corresponds considerably with the successful vaccination after vaccination. That is not a point to which your attention has been directed?—No; my attention has not been directed to that point. I have been interested, in fact I have suggested, that some experiments should be made in re-



vaccination of small-pox cases with animal lymph. I do not consider it is fair to compare vaccination with humanised lymph after small-pox with M. Layet's table, where the patients had been re-vaccinated direct from the calf.

12,153. (*Sir Guyer Hunter.*) As I understand, in answer to Question 12,120, you support your views there by the statement that it was Dr. Seaton's belief?—Yes.

12,154. Could you point out any passage in his book which would substantiate that view?—I spoke from memory.\*

12,155. As far as I understand—and I think I am correct in that—was it not the fact that Seaton's contention was the reverse?—Possibly owing to the quotation being the words of Sir John Simon, I was confounding the two; it was certainly Sir John Simon's belief that the vaccinated practically had had the small-pox.\*

12,156. (*Sir William Savory.*) May I call attention to another answer of yours to Question 11,852, with regard to the duration of the protection afforded by vaccination which you limited to three years?—To the variolous test.

12,157. And you quote Brown there in favour of that view?—Yes. I not only quoted his test experiments, but also his 48 cases in children.

12,158. What is the date of that communication of Brown's?—1809.

12,159. Do you know a paper of his in the Edinburgh "Medical Journal" 10 years later—1819?—I cannot say that I recollect it now.

12,160. May I read you an extract from that paper? He says this at page 87: "Every medical man of the 'smallest pretensions to candour must allow it' (vaccination) 'possesses anti-variolous powers of a remarkable nature; that the phenomena which attend the discovery were sufficient to encourage the most flattering prospects; that Dr. Jenner acted as a correct inquirer, and is fully entitled to the public remuneration he obtained.' You are not acquainted with that?—No; but I do not think that is inconsistent at all with his conclusions of 1809.

12,161. Now I will call your attention to another passage at page 67: "Where the small-pox contagion has 'access to operate upon vaccinated cases of upwards of 'six years' standing and the contagion applied in concentrated and lasting form, nearly the whole of such 'cases will yield to the influence of the small-pox contagion.' That is not quite consistent with any statement of his in support of your view?—It is rather extending the time given in his original work if he fixes it at six years.

12,162. Again, at page 73, "Few or none escaped at 'the distance of six years after vaccination that were placed in circumstances favourable for the operation of the epidemic; very few at four years; and the greatest number who resisted the contagion were either within four years or not exposed to a concentrated and extensive application of the contagion.' Then there is another important matter in relation to a statement of yours, a point which Brown refers to; he says, at page 68, "There, however, can be no doubt 'that according to the extent and severity of the 'phenomena which attend the' (vaccination) 'puncture so will be the impression on the system.' And then further on, on pages 68 and 69, he says, "If the puncture shall be slight, and if only one, then, in general, 'the operation will either fail or a very imperfect vesicle will be produced, and of course a very feeble impression made on the system, and which will allow 'the operation of the small-pox contagion to influence 'the system some years earlier and produce a more severe disease.' And, again, at page 71, "I always considered it of the very last importance in conducting the vaccine process to produce as severe a disease as possible." This is from a paper of his 10 years later?—I did not remember that.

12,163. (*Chairman.*) Do you agree with the latter view?—I think certainly that the results locally depend

to a certain extent upon the way in which the operation has been performed; that M. Layet draws attention to; but still I am inclined to agree with M. Layet's extended experiments, that the protection is not to be measured by these local results, and I may point out that there were some experiments made in which auto-protection was shown after a hypodermic injection of lymph where there was no local vesicle and no scar at all; so I think I should certainly abide by the extended experience of M. Layet.

12,164. (*Dr. Collins.*) Are you acquainted with a paper written by Dr. T. Brown, of Musselburgh, in 1842, twenty-three years later than the paper Sir William Savory has quoted, entitled "An investigation of the 'present unsatisfactory and defective state of Vaccination. A series of letters to Dr. George Gregory.'" At page 137 in his last letter he says, "As far as present experience goes, much above a half of all who 'have placed their security in vaccination have undergone an attack of small-pox, and that there is no security for anyone who has undergone vaccination as 'a protection against the variolous epidemic'?—I think I remember the statement, but I have read so many of Brown's papers and the controversy which took place that I do not recollect that particularly, and I think his ultimate conclusion is fairly summed up in a belief in a very transient antagonism.

(*Chairman.*) Does he give the particulars upon which he bases the broad statement that half had had small-pox?

(*Dr. Collins.*) He quotes from Stewart, of Kelso, and various other authors.

(*Professor Michael Foster.*) Was this Brown or Brown's son?

12,165. (*Dr. Collins.*) I observe that in the paper to which I have directed your attention Dr. T. Brown points out, on page 2, that he was "the first medical practitioner who challenged in a regular medical inquiry the anti-variolous power of the vaccine as the 'result of experience and experiment'?—Then I should say that he was undoubtedly the same Brown.

12,166. (*Professor Michael Foster.*) Brown was in the habit of making wide statements, was he not?—I think his conclusions were pretty definite.

12,167. Did he not state that cow-pox was confined to one small county in England and existed nowhere else?—He did say so; that was the belief at the time in England, and not only in England, but in Europe; it was referred to as the "Gloucestershire disease."

12,168. (*Chairman.*) If it was correct that in 1842 more than half the vaccinated people had small-pox, unless vaccination tended to make those people take small-pox more than the unvaccinated, would that not lead one to the belief that more than half of the population had small-pox?—I should have to read all his works again to answer that. It is three years ago that I went through all his papers; he was probably drawing his conclusions from the numerous outbreaks of small-pox which occurred in Scotland about that time.

12,169. (*Sir William Savory.*) But you would hardly regard Brown's testimony as confirmation of your view as to the limitation of the protection to three years in the face of this, would you?—I did not absolutely limit myself to any date. I said there were a certain number of cases which led me to admit the possibility of there being a transient antagonism, for, in some cases, six months, in some cases two or three years. I was not inclined to go beyond that.

12,170. (*Sir Guyer Hunter.*) Is the only reference in your book bearing upon the point of the transient antagonism between vaccinia and small-pox that which is given in your answer to Question 12,149?—No, that is not the only one; there are several references in Chapter V., and the other reference which bears upon the same point is the statement that those diseases, cow-pox, horse-pox, and cattle-plague, exercise no specific protection. I have already explained what I meant by specific protection.

12,171. Do you regard as such transient antagonism the practically extraordinary immunity from small-pox which attaches to children and others who have within a comparatively recent period undergone vaccination. Before you give your answer to that, I would call attention to the statement of Dr. Ogle before the Commission, especially in the striking table published at page 114 in the Appendix to the First Report, and I would ask you to refresh your memory upon that point?—

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\* On pp. 54, 55, Dr. Seaton expresses his belief that cow-pox is "small-pox of man conveyed to the cow." He also says: "Probably the experiments of Thiele and Ceely have been known chiefly in France 'through the singularly inaccurate and imperfect account of them given in the classical work of Bousquet, and probably also the confirmation they have received from the repeated experiments of Mr. Badcock is there quite unknown; but certain it is that the variolous origin of cow-pox, which has been completely accepted in this country for the last quarter of a century and more, has remained in France one of the open questions.'"—E. M. C.



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There we enter upon statistics and it would be necessary to thoroughly investigate all the circumstances surrounding the whole question of those statistics.

12,172. Still you gave a very definite opinion as to your views upon the transient antagonism between vaccinia and cow-pox; do you still adhere to that; do you consider that it affords sufficient evidence in support of your views?—I do. The only way in which I can attempt to harmonize all the conflicting statements is to admit the possibility of there being a transient antagonism. I shall come to evidence directly which seems even still further to limit that; but I am perfectly willing to admit that there is evidence on both sides of the question.

12,173. And you admit that after a careful examination of Dr. Ogle's statement?—I do, but I would not take that table by itself.

12,174. (*Chairman.*) You now desire to make some observations upon sheep-pox?—I should like to direct attention to this disease. I have already referred to it on page 329 of my first volume; but instead of reading the passages from my own work I should like to draw attention to Mr. Fleming's statement with regard to sheep-pox. He says: "If we desire to study a form of 'variola in animals which most closely resembles the small-pox of man we can only find it in sheep. In this ovine scourge we observe a similarity almost approaching identity which is very striking. In its extreme infectiousness, the great mortality it causes, the high fever and generalised eruption, as well as the character of the eruption, the symptoms and lesions which mark its course, the complications so frequently arising as well as its being often present as a widespread epizooty—all this approximates sheep-pox in the closest manner possible to small-pox. But the diseases are not due to the same germ or virus, for sheep-pox prevails in a manner continuously in countries where small-pox is extremely rare, as in East Prussia; and in countries where the latter is always prevalent, sometimes as an epidemic, as in England, sheep-pox is unknown. In fact, the one disease has no influence either in the production of or protection from the other, for it seems to be firmly established that human variola will not produce sheep-pox, and that while inoculation with the virus of the former will not protect from the latter, that of the sheep-pox will not prevent small-pox. It has been denied that ovine variola cannot be transmitted to mankind, and the extreme rarity of cases of supposed accidental transmission would go to support this opinion. But several instances have been recorded, nevertheless, of veterinary surgeons who have suffered through accidental inoculation; local and general disturbance like that produced by vaccination ensuing." Dr. Sacco gives a very fair representation of this disease of sheep. Now I find Mr. Fleming says that the one disease has no influence either in the production of or protection from the other. If it is a question of a specific protection I agree with him, but I am bound to say that there is evidence which supports the expression I have used, namely, that there may be a transient antagonism between sheep-pox and small-pox. I should like to direct the attention of the Commission to the experiments of Dr. Marchelli in 1802, who inoculated human beings with sheep-pox; those experiments were followed up by Sacco. Sacco collected some sheep-pox lymph: he gave the lymph to Dr. Legni, who inoculated six children. At page 331 of my first volume I gave Dr. Legni's letter, in which he says: "I have used this matter for two years, and I have inoculated more than 300 infants with it, of whom 100 were at Pesaro, where small-pox has since reigned for three consecutive years; and where, in spite of such a prolonged and fatal epidemic, all those inoculated with the sheep virus have been preserved from this fatal distemper, although they were in very close communication with those who were attacked by small-pox." Now if we are to accept these different statements I think that we can harmonize Mr. Fleming's rather sweeping assertion of no influence by assuming that there may be in the case of sheep-pox a transient antagonism. Further experiments were made on behalf of Sacco, an account of which was sent by Dr. Magnani, of Aulla; he found slight differences, he says, in the effects when compared with ordinary cow-pox. Other observers, however, have failed to produce upon the human subject a vesicle which could not be distinguished from a vaccine vesicle; there is also very conflicting evidence with regard to the inoculation

of cows with sheep-pox, some saying they have succeeded, others that they have failed. I have already referred to the experiment of Marson who inoculated a patient with sheep-pox and produced a vesicle having somewhat a bluer tinge; he says it "was protective against small-pox, as we ascertained by inoculating the patient afterwards with the lymph of human 'variola.'" That was the experiment in which he admitted the possibility of having used a contaminated lancet, although he himself was convinced that it was perfectly clean and free from vaccine lymph. I think the failures do not invalidate the successful experiments, and that we can harmonize the experiments by accepting the view that by managing the lymph of sheep-pox a vesicle can be obtained which has the character of the cow-pox vesicle when inoculated on the human subject; and, although, according to Fleming, human variola will not protect against sheep-pox, we have on the other hand the statements of Marchelli and others, and we can harmonize all those statements by accepting the view that there is in the case of sheep-pox a transient antagonism.

12,175. (*Professor Michael Foster.*) Do you know Chauveau's experiments upon that point?—I do not.

12,176. Chauveau expressly experimented upon the relation of sheep-pox to variola, upon the cow, and found that there were no mutual effects at all?—I do not bear in mind the details of his experiments, but I am aware that that was his conclusion.

12,177. Chauveau carefully investigated the relation of sheep-pox to variola, and came to the conclusion that the one had no effect upon the other, so far at all events as the cow was concerned?—Yes, that was so.

12,178. (*Dr. Bristowe.*) You allow that sheep-pox inoculated on the human being has the same influence over future attacks of small-pox as cow-pox has?—Judging from this statement of Marchelli's and the evidence of Marson there would appear to be evidence of a transient antagonism.

12,179. (*Dr. Collins.*) Can you tell the Commission anything of the nature of the vesicle which is the result of the inoculation of sheep-pox?—For all practical purposes I should say it could not be distinguished from transmitted cow-pox; there probably being not more difference upon the human subject between the sheep-pox vesicle and the cow-pox vesicle than between the vesicles from different stocks of cow-pox lymph. I have already mentioned that Marson said that the vesicle was of a bluer tinge, and Dr. Magnani also observed slight differences.

12,180. You would regard the variola ovina as a perfectly distinct disease from cow-pox and also from horse-pox, would you not?—Specifically distinct.

12,181. Reverting again to the question of the identical nature of the various variolæ, I find on page 46 of Seaton's Handbook the statement: "The truth of the more essential part of the teaching—the common origin of the variolæ vaccinae, variolæ equinae, and variolæ humanae, from one specific infection—has been established by conclusive experiments." Was that the kind of view of Seaton's which you had in your mind when you answered "Yes" to Question 12,121?—Yes; but I should not endorse that statement of Seaton's.

12,182. I understood you to take the opposite view to Dr. Seaton, understanding that the view I read to you was his?—That was so.

12,183. (*Sir James Paget.*) What would you call the disease communicated by inoculating sheep-pox on man?—That is an extremely difficult question; whether we ought to call it an abortive form of sheep-pox or not I cannot say; but if it no longer will produce the phenomena of sheep-pox it certainly must be distinguished from natural sheep-pox.

12,184. Would you hold that horse-pox, sheep-pox, and cow-pox all have a certain influence in producing a temporary antagonism to small-pox?—I admit that there is evidence of that, and that there is also conflicting evidence, as in the case of sheep-pox, where for instance if we accept some of these statements we can explain them by assuming a transient antagonism; on the other hand, if we pin ourselves to the experiments quoted by Professor Michael Foster they go against that conclusion. I think we must leave it an open subject.

12,185. There is no practical deduction to be made from them?—There is this practical deduction to be made from a pathological point of view; all the ex-



periments in which vesicles were obtained upon the human subject I accept, and I think they must be taken into consideration with the experiments I shall afterwards refer to with reference to the inoculation of cows with small-pox. It does not prove, because certain observers succeeded in producing a vesicle on the cow or on the human subject with human small-pox (which could not practically be distinguished from cow-pox), that small-pox is cow-pox; because we should have similarly to believe that sheep-pox is also cow-pox.

12,186. Can sheep-pox be so transmitted to the cow?—The evidence is conflicting. De Paul says yes, and that it will produce a perfect vesicle.

12,187. Do you accept that as equally strong with the evidence of those who say that it cannot be?—I think so far as the cow is concerned it is again an open subject, but I find it difficult to eliminate the experiments upon children.

12,188. Sacco's experiments you have read carefully, or the experiments he inquired into; do you think they were made with such care that you could put any reliance upon them? Were not they made by some one in the country whom he saw for a day or two, and then received reports from?—Some were made with care, and some were open to question; because he vaccinated with cow-pox on one arm and sheep-pox on the other; but as some were done by regular practitioners we must not eliminate them altogether; and I am inclined to think that Marson's experiments bear out that conclusion, because he inoculated a child with sheep-pox and carried on the inoculations for several weeks, and he describes the vesicle as being somewhat different; he also says he believes that the lancet he used was perfectly clean and free from vaccine lymph.

12,189. (*Professor Michael Foster.*) Is that a different case from the one to which you referred the other day, at Questions 11,877-9?—No, it is the same.

12,190. Is it not Marson who says that he had no confidence that the lancet was not contaminated previously with vaccine?—His language is rather ambiguous; his statement is, "We had unfortunately used for the original ovination the same lancet instead of having a new one, as we ought to have had, that we had previously used for vaccinating; and although it was, as we believe, perfectly clean and free from vaccine lymph."

12,191. As an experimenter, do you place much confidence in that "as we believe?" In experiments which you are conducting do you trust much to a condition which you "believe" to exist?—Certainly not. We should not draw any foregone conclusions; but I am inclined to attach more importance to those experiments from a comparison of the inoculation of the cows with small-pox lymph. There one has to take the same ground, for although numerous investigators, and able investigators like Dr. Klein, failed, still others, without any question, succeeded. I believe the difficulty arises from the fact that it is a case of inoculating a disease upon a foreign soil; inoculating sheep small-pox upon man is inoculating a disease upon a foreign soil, that is why there is so much difficulty, but now and then it will succeed. So, too, in inoculating small-pox upon cows I apply the same explanation, that the occasional success and the numerous failures are to be attributed to the fact that it is inoculating a disease upon a foreign soil.

12,192. (*Sir James Paget.*) Is there any series of facts following inoculation with sheep-pox which can be compared with those of Ceely, Badcock, and others, of inoculating with the material of small-pox passed through the cow?—Nothing like so extensive.

12,193. (*Chairman.*) You propose now to pass to the subject of cattle-plague?—The doctrine having been accepted that cow-pox was cow-small-pox, experiments were made in India with the disease called by the natives cow-small-pox. In 1832 experiments were performed by Dr. Macpherson in Bengal. Those experiments I have related on pages 319 and 320 in my first volume. With regard to this disease Dr. Macpherson describes thus the appearances of the animal. He says, "The mouth and fauces appeared to be the principal seat of the disease, being in some instances one mass of ulceration, which in all probability extended to the stomach and alimentary canal," and so on. Two children were inoculated with this disease, and the vesicle which resulted assumed the characteristics of true vaccine. Then, "Two children were vaccinated from this patient with the most complete success,

"but the symptomatic fever was more severe than I have ever observed it in former instances. Five children were vaccinated from those just mentioned, and the result was equally successful, after which no difficulty was experienced in disseminating the disease. "With the view, however, of satisfying myself that true cow-pox was introduced, I had two children who had been vaccinated with the fresh virus inoculated with small-pox, and both were happily found to be secure." He also says that "Five children in the Gorah Bazaar at Berampore were vaccinated, and shortly afterwards were accidentally exposed to the various contagion by residing in the same huts where the disease was raging very dreadfully, but not one of those vaccinated was in the slightest degree affected by variola." Then Mr. Macpherson's example was followed by Mr. Furnell, and Mr. Brown, his assistant, took some of the scabs from the back or abdomen of diseased cattle, and reduced them to a pulp with water, and inoculated four children. Mr. Brown also vaccinated the children of Major Orchard, and Mr. Furnell also inoculated his own child from one of the cases, and the child died. In some of the cases he says eruptions similar to the preceding small-pox appeared. In the case of his own child a very thick eruption appeared on the face, and followed the course of small-pox in its worst form. And Mr. Furnell says, "I feel that it is right . . . to warn my brethren of the danger that sometimes occurs after taking the virus from the cow in this climate. Matah in the cow of this country is decidedly a much more serious disease than the vaccine diseases in the animal in Europe. And it will be seen from the above statement that the inoculation from it is, in the human subject, followed by a most dreadful disease, but I will refrain from further remarks; but I think it is necessary to state that such precautions were taken in this trial that it was almost impossible that any admixture of the variolous disease could have been made, as all the children mentioned were vaccinated direct from the cow." Thus it appears that there was small-pox in Sylhet at the time; and it is quite possible that the eruption which supervened after the introduction into the arm of the virus of cattle-plague, was due to small-pox. I have found a more recent reference to these experiments, the Report of the Indian Cattle-Plague Commission for 1871, and there I read that "Abundant evidence exists that cattle murrain visits the districts of this division frequently and severely, though a very continuous or detailed account of its prevalence cannot be given, neither can any date be assigned to its first appearance. As early as 1832 Dr. Macpherson, then superintendent of vaccination at Moorshedabad, observed that cattle were liable to what is called matah. There was at this period a very universal endeavour made to discover natural cow-pox. The supply of vaccine lymph obtained from England was unsatisfactory in its results, and it became known that cattle were liable to an eruptive affection to which the natives applied the same name as they applied to human small-pox. What could this possibly be but cow-pox? Dr. Macpherson accordingly selected some cows suffering under this malady, clothed them in blankets, and removing the crusts which he found developed on the udder on the ninth and tenth days of the disease, used these to vaccinate children and succeeded in producing a vesicle to all appearance vaccine. From the vesicle so produced lymph was taken, sent all over India, and used for vaccination. This discovery took the medical men of India by surprise, and produced no little agitation at the time. Efforts were made elsewhere to imitate Dr. Macpherson's practice, and the experiments conducted in Sylhet, described under the Dacca Division, and the observations of Dr. Duncan Stewart in Calcutta, presented in the papers relating to the Presidency Division, were the offspring of the Moorshedabad experience." And then a little further down the page it goes on: "The most remarkable peculiarity noted in describing the effects of the inoculation of human beings with these crusts is that the effects were more severe than those caused by the usual vaccine virus, and this was looked upon as rather an advantage, inasmuch as it recommended the procedure to the natives of the country, who had hitherto been accustomed to the more violent manifestations of variolous inoculation. In Calcutta the lymph soon became mixed up with that hitherto in use, and there is an absence of accurate detail as to its behaviour and results in other places. It was, no doubt, soon superseded by the regular

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"supply, and it does not appear that, with the exception of the unfortunate Sylhet experiments, any effort was made at Moorshedabad or elsewhere to repeat Dr. Macpherson's practice." Then on page 241: "Dr. Macpherson writes on the 4th of January 1835 that no case of matah had come to his notice since 1833. The unfortunate Sylhet experiments had by this time been published and discussed, and evidence collected elsewhere by the Medical Board placed the severity of the newly discovered disease of cattle in such a strong light that the mind of the profession refused to accept it as an approved substitute and representative of vaccinia, and the whole matter appears to have dropped." That gives you the history of these experiments; and I think it also shows conclusively, if we accept this statement (and I like to accept statements if possible) that from cattle-plague also a vesicle can be obtained which has the physical characters of the vaccine vesicle; but this does not afford any ground for the belief that cattle plague was therefore a form of cow-pox; they are perfectly distinct diseases. I am convinced that from these specifically distinct diseases vesicles similar in appearance can be produced upon the human subject. I may say that there was one case of a veterinary surgeon who had inoculated himself in this country, he was examined by Mr. Ceely who said that the result corresponded with some of his cases of casual cow-pox in the milkers; but casual cattle-plague does not commonly occur, because in India more especially, where cattle-plague is not at all uncommon, the natives have a horror of handling the diseased animal, so that the animals are not milked; so one would not expect to find frequent cases arising in the attendants upon animals. Mr. Hallen, the President of this Commission, recently informed me that cases do now and then occur, though rarely.

12,194. I gather from what you read that although you say that lymph taken from an animal suffering from cattle-plague produced a vesicle similar to the vaccine vesicle, the two cases differed, inasmuch as the person treated with the lymph from the animal suffering from cattle-plague suffered much more severely than the person treated with ordinary vaccine lymph?—Yes, that was so.

12,195. In what respect was the suffering more severe, you have told us the similarity, what was the dissimilarity between the two cases?—The dissimilarity was in Mr. Furnell's experiment; on the third day of the fever, after the production of the local vesicle, a very thick eruption appeared similar to that of small-pox; and in the case of his own child, which had a fatal result, "a very thick eruption appeared on the face, and followed the course of small-pox in its worst form," but it is difficult, without carefully studying the experiment, to be perfectly sure whether the eruptions resulted from an inoculation of cattle-plague, or whether in those particular cases they afterwards caught small-pox in the village.

12,196. That had relation to the Sylhet cases; but I do not gather that the statement with regard to the greater severity was derived from the Sylhet cases?—Yes, Mr. Furnell made that statement, he was the one who warned his brethren of the danger. With respect to Mr. Macpherson's cases also, it is quite true that they were more severe, more severe, that is to say, than the ordinary phenomena of vaccination but not more severe than the inoculation of cow-pox lymph recently obtained from the cow.

12,197. How did this greater severity manifest itself; what appearance did it take?—"Two had very slight inflammation on the arms on the third and fifth days; two had considerable local inflammation and slight heat of surface on the fifth, sixth, and seventh days, but no vesicle formed, although there was marked induration round the puncture. The remaining child's arm was slightly inflamed on the fourth morning, and a vesicle was apparent the next day, which continued to increase till the ninth day, when I was much gratified to find that it assumed all the characteristics of true vaccine. The poor little child, the subject of this experiment, was about five months old, and suffered much from fever for four days, by which he was greatly reduced, but very soon recovered."

12,198. (Mr. Meadows White.) His own child died, did it not?—Mr. Furnell's own child died.

12,199. (Professor Michael Foster.) On page 326 of your book you speak of Macpherson's cases as being those in which an eruptive complaint of a true variolous

nature was produced?—Yes, that is a quotation from Baron, and I have let the quotation stand, because I have not been able to verify it; so that anyone wanting to work out that subject further must look up the reference and follow it out.

12,200. (Sir James Paget.) You have referred to the preference that the natives had for this operation because of the lightness of the eruption compared to an attack of small-pox?—With regard to the effect upon the natives and the natives preferring it, that statement I made after a reference to both Dr. Macpherson's and the Sylhet experiments. I am afraid I should have to read Mr. Macpherson's paper again, but I do not think he referred to that.

12,201. (Dr. Bristowe.) Is it not possible that the disease produced in those children was small-pox and not cattle-plague, that is to say, that small-pox was transmitted from child to child?—I do not think so, because those experiments were repeated in quite different parts of India; and Macpherson gives the pedigree of his cases. He simply says the effects were rather severe, but he does not say anything in his paper of variolous eruption; it was only Mr. Furnell who met with the variolous eruption.

12,202. Then, again, I would ask you, is it quite certain that the disease in cattle at that time was true cattle-plague?—I think there is no question about that at all; it is a question I have had considerable opportunity of studying; this disease Matah or Bussunt is unquestionably cattle plague.

12,203. I am not asking what the disease that prevails now happens to be, but I am talking of the disease from which those children were inoculated; is it perfectly certain that that was cattle-plague?—I think so; because Mr. Macpherson carefully describes the disease, and his description of the disease from which he obtained the lymph is a classical description of cattle-plague.

12,204. (Chairman.) Where does he give that?—In the Transactions of the Medical and Physical Society of Calcutta.

12,205. (Professor Michael Foster.) Was not some doubt supposed to be introduced through the operations having been performed by natives, who were supposed not to be entirely trustworthy?—That was with regard to some of the later removes when this variolous eruption appeared.

12,206. (Sir Guyer Hunter.) When you use the word "matah" do you use it as applying to cattle-plague, or do you restrict it to small-pox?—I use the term "matah" as the term used by the natives for rinderpest or cattle-plague.

12,207. Are you quite sure? I certainly never heard it applied to the cattle-plague at all. Matah means small-pox, and is the name applied to the goddess of small-pox?—In this case matah is applied to the cow.

12,208. Certainly in the Western Presidency the term matah is restricted to small-pox; it is the Goddess Matah who presides over small-pox?—That may undoubtedly be so, but it is a name which is applied by the natives to the cattle-plague. I would refer Sir Guyer Hunter to the Report of the Indian Cattle-Plague Commission (1871), which was presided over by my friend Mr. Hallen. On referring to plates, of which I possess the original, there is no doubt whatever that "matah" corresponds with our disease, cattle-plague. This, for instance, is a perfectly typical plate of cattle-plague.

12,209. (Chairman.) I observe in Dr. Macpherson's experiments that the greater number of the children he inoculated did not exhibit any vaccine vesicles at all, it was only one out of eleven; was not that so? On six no effect whatever was produced; "two had very slight inflammation on the arms on the third and fifth days; two had considerable local inflammation and slight heat of surface on the fifth, sixth, and seventh days, but no vesicle formed, although there was marked induration round the puncture. The remaining child's arm was slightly inflamed on the fourth morning, and a vesicle was apparent the next day." It was only on one out of the eleven that that effect was produced?—Yes, and it was that successful case which was the source of lymph for two other children, and from them five other children were inoculated, and then, as the report said, the lymph was distributed all over India.

12,210. At that time small-pox apparently was raging in that district?—Yes.

12,211. (Professor Michael Foster.) Is not there some reason to think that Mr. Brown did not vaccinate him-



self, but employed native vaccinators?—In some cases he used native vaccinators, in others he did not.

12,212. But in the first case, I speak from memory only?—In the first case it is distinctly stated that Brown took the scabs from the back of the animal, powdered them up, and applied them himself.

12,213. Were there not cases which appeared at first to be carried out by a European vaccinator but were in reality carried out by native vaccinators?—There were cases in which the further removes were carried out by native vaccinators.

12,214. (*Chairman.*) Dr. Macpherson was under the impression that this was the same disease as cow-pox as described by Jenner?—Quite so.

12,215. He was under that impression, not by reason of these experiments, but before he began his experiments?—Quite so; he was entirely misled by Baron, who described cow-pox in this country as really cattle-plague, and justified Jenner's calling cow-pox "cow-small-pox," on the ground that cow-pox was really cattle-plague, which had long been called cow-small-pox.

12,216. You infer that this was cattle-plague as distinguished from cow-pox, not on account of any view taken by Mr. Macpherson, but because in your view the symptoms he describes are a description of cattle-plague?—Yes; the description he has given is a classical description of cattle-plague; and then, again, the disease he referred to, *matah*, has been investigated by the Commission of 1871 and shown to be cattle-plague.

12,217. (*Dr. Bristowe.*) Is it stated what process was followed in the insertion of the matter of the cattle-plague into the human being?—Yes; Mr. Brown took the scabs from the backs of the animals. Having gone more fully into this subject owing to the Cattle Plague Commission Report, Dr. Murchison's account must be slightly modified in that respect.

12,218. What was Dr. Murchison's account?—Dr. Murchison described the appearance of pustules, and pointed out that there was a very close analogy with human small-pox.

12,219. Where does he describe that?—In the Cattle Plague Report.

12,220. Are you sure that he describes that in the Cattle Plague Report?—Yes. In describing the eruption Murchison says (page 75 of the Appendix to the Third Report of the Cattle-Plague Commissioners, 1866): "In both cases the eruption extends from the skin to the interior of the mouth and nostrils; in both the pustules and scabs are preceded or accompanied by patches of roseola."

12,221. If that was his statement it is incorrect, it is different from that of the other investigators?—One must modify that account, because pustules very rarely do appear; sometimes, however, they do appear. In these Indian cases there is occasionally a pustular eruption, but not as a rule.

12,222. (*Dr. Collins.*) On page 79 of the Cattle Plague Commissioners' Report, 1866, I find Murchison says, in his seventh conclusion: "Small-pox is the human malady which it" (the cattle-plague) "most closely resembles. The resemblance holds good, not merely, to a great extent, in the cutaneous eruptions of the two diseases, but in their symptoms and anatomical lesions, and in their extreme contagiousness and capability of propagation by inoculation." Then he goes on: "The resemblance between rinderpest and variola is sufficiently striking to demand immediate inquiry, whether vaccination or an attack of ordinary cow-pock confers future immunity from rinderpest, or modifies its course." Now such a vaccination was put into use, was it not?—Yes. I think you will find I have given those particulars in my chapter upon the cattle-plague.

12,223. Will you tell me briefly what was the result?—The result was a complete failure, that was subsequently acknowledged.

12,224. (*Chairman.*) In what respect?—That cow-pox exercises no protection whatever against the cattle-plague, with this slight exception, that Murchison has said that in some cases there was a slight indication of effect, but as a practical measure it was valueless.

12,225. Have there been any other experiments with regard to the inoculation of undoubted cattle-plague besides the Indian ones to which you have called attention?—I have not been able to find any.

12,226. Have there been no experiments made when the cattle-plague was being investigated to see what

sort of a vesicle, if any, would be produced?—I think not; there was only the case of accidental transmission from the animal to the hand of Mr. Hancock.

12,227. (*Dr. Bristowe.*) If I remember rightly that was from the dead and not from the living animal?—Certainly.

12,228. Therefore, not impossibly or improbably, a mere case of septic poisoning?—Possibly.

12,229. (*Dr. Collins.*) We may take it that a certain resemblance between a cattle malady and a human malady, apart from experimental peculiarity, would not of necessity suggest any mutual prophylaxy between the two?—No.

12,230. With regard to this case of Mr. Hancock, I find that Mr. Rayner, under whose care the case appears to have come, had no hesitation in pronouncing the case to be one of vaccinia?—That is so.

12,231. Then I find that Professor Spooner saw the case and also recognised the vaccine character of the vesicle?—Yes, that was so.

12,232. "The appearances at once suggested to Dr. Quain and myself," that is, Dr. Murchison, "a receding vaccine vesicle"?—Yes.

12,233. "On December 20th this opinion was stamped with the high authority of Mr. Ceely?"—Yes, you will find that on page 315 of my Volume I. I have there quoted Mr. Ceely's description of the case, and his comparison with typical cases of casual cow-pox on the hands of milkers.

12,234. (*Dr. Bristowe.*) At the same time the case was not like an ordinary case of cow-pox?—It is not like the ordinary phenomena of vaccination, but it is almost exactly like some of his plates of casual cow-pox on the hands of milkers.

12,235. (*Mr. Bradlaugh.*) In the course of your evidence upon previous days you have used expressions such as "transient antagonism," and "protection;" do "antagonism" and "protection" bear the same meaning in your mind?—Not at all.

12,236. What is the distinction you draw between "antagonism" and "protection"?—I know of no disease which does exercise upon another specifically distinct disease what I distinguish as protection; I think I may explain the meaning of these terms in this way: by, for instance, drawing attention for the moment to experiments with anthrax. Now anthrax, I maintain, exercises a specific protection against itself; there is nothing else that will protect against anthrax in the way in which it will protect against itself. At the same time the results of experiments have shown that inoculation of certain bacteria, such as the bacillus pyocyaneus, will prevent for a brief period the development of anthrax, but after a time that passes off. Now that effect I should call simply transient antagonism, and not to be compared at all with the specific protection which one attack of anthrax exercises against future attacks.

12,237. (*Chairman.*) I understand the distinction between "transient" and "permanent"; but do you draw such a distinction between "antagonism" and "protection" that you think it would be correct to say there is a transient antagonism, but that it would not be correct to say there is a transient protection?—I do make that distinction. The "transient antagonism" is simply to cover the ground of cases such as I have mentioned.

12,238. Is there any distinction between transient antagonism and transient protection, or is that only a change of words? Whatever length of time the protection lasts, during the period of antagonism, would it be right to use the word "protection"?—No, I would rather not use the word "protection" there, because I have endeavoured to use it solely to indicate that peculiar immunity which, for instance, one attack of scarlet fever produces from future attacks.

12,239. (*Mr. Meadows White.*) So long as the antagonism lasts there is protection; that is to say, the system does not receive the disease while the antagonism lasts?—That is so.

12,240. (*Mr. Bradlaugh.*) But would "antagonism" necessarily always mean "protection," might it not mean something other than protection?—It does not necessarily mean protection, it may only delay the onset of the disease; a transient antagonism is not a thing which can be relied upon.

12,241. (*Mr. Picton.*) Did I understand you rightly to say that inoculation by cattle-plague would produce a

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vesicle which was indistinguishable from the vaccine vesicle?—Yes, practically.

12,242. Do you also say that the same thing could be done from sheep-pox?—Yes.

12,243. Or any other disease, which would produce a vesicle like the vaccine vesicle. Would you recapitulate the sources from which you know that a vesicle can be produced precisely similar to the vaccine vesicle?—That I shall pass on to in my next statement. At the same time may I just draw attention to goat-pox, although I would practically pass that over, because the evidence that we have with respect to it is so very small.

12,244. But before going to that would you mind completing the information I want. Is it possible that a child might be inoculated from a source like cattle-plague, and that the vesicle produced would be indistinguishable by a skilled physician from the vaccine vesicle?—Yes.

12,245. And the same thing from sheep-pox?—Yes, the same thing from sheep-pox.

12,246. Or horse-pox?—Yes.

12,247. (*Sir William Savory.*) Or cow-pox?—Yes, or cow-pox or human small-pox.

12,248. Upon what authority do you state that?—Perhaps I had better complete the statement with regard to the variola vaccine, and then answer *Sir William Savory's* question.

12,249. (*Chairman.*) One question I want to put with respect to a recent answer of yours; you say you distinguish between transient antagonism and protection because transient antagonism cannot be absolutely relied upon. I think that was your language?—It cannot be relied upon; that was my expression.

12,250. What you call "protection," namely, an attack of small-pox, as protecting against a second attack, cannot be absolutely relied upon, can it?—It can be relied upon to a very different degree. It can be absolutely relied upon for a time.

12,251. There can be no different degrees of "absolute"?—Allow me to explain. The protection afforded by small-pox against small-pox is the rule and not the exception, and that fact is acknowledged by the whole profession. So also with regard to the protection afforded by measles against measles, and scarlet fever against scarlet fever. Now we are arriving at certain experiments between diseases which have no relation or which have some relation but are specifically distinct, and there we get evidence of a very fleeting effect, a temporary tolerance of a disease while under the influence of another.

12,252. But we are talking now, not of the transient character of the effect, but of the distinction between the effect while it lasts; was it not with respect to that that your answer was given, and my question is confined to that. So long as the effect lasts, even assuming it to be transient, I do not quite understand what is your distinction between "antagonism" and "protection." Protection in the sense in which you use it is not absolute; the antagonism in the sense in which you use it is not absolute, and during the time that it lasts what is the distinction between the antagonism and the protection?—None practically, so long as it lasts; but there is a great distinction as to time and the nature of the protection.

12,253. (*Sir James Paget.*) It is a distinction of degree but not of kind?—It is a distinction of degree and of kind, though we cannot explain what the "kind" is, that is to say, we do not know what it is which makes one attack of scarlet fever produce an immunity throughout life, either complete or incomplete, against another attack.

12,254. Do you not imply a distinction of kind when you call one by the name of antagonism and the other by the name of protection?—I do.

12,255. That is a difference of kind?—Yes.

12,256. That is more than a difference of degree?—It is both a difference of kind and of degree.

12,257. (*Chairman.*) What are the phenomena which lead you say there is a difference in kind, because we only know either of them by their phenomena, I suppose?—Take, for instance, the vaccination of cow-pox, that was tried as a protection against cattle-plague. It appears in certain cases that there was some evidence that in cattle quite recently vaccinated when exposed to

the cattle-plague there had been some antagonistic effect, but at the same time those animals some months, or a year, afterwards caught cattle-plague; so there was a sort of temporary antagonism probably which had completely passed off in that very short time. There was nothing which could be compared to the immunity which is permanent, whether complete or incomplete, as after, for example, an attack of small-pox.

12,258. (*Mr. Hutchinson.*) May not the antagonism be incomplete in kind as well as transient; that is to say, only capable of modifying the subsequent contagion, not protecting even for a short time from it, but yet modifying it?—Yes; I think that is borne out by experiments with septic organisms and anthrax.

12,259. (*Mr. Picton.*) In which class would you put the transient influence of vaccination in which you believe; is it protective or antagonistic?—Antagonistic.

12,260. Not protective?—Not protective.

12,261. (*Sir William Savory.*) Why not protective?—Because it does not bear that same relation which one attack of small-pox bears to another attack of small-pox.

12,262. (*Chairman.*) Does the antagonism render it less likely that one will have the disease than if there were no such antagonism?—Less likely so long as it lasts.

12,263. Does the antagonism during the period for which it lasts render one less likely to get an attack of small-pox than if there were no such protection?—Certainly.

12,264. Would it be any abuse of language to call it therefore during that period some protection?—I do not like the use of the term "protection," because that might lead people to believe that there was the same character of protection as in the case of scarlet fever against scarlet fever or immunity from small-pox. Because the inoculation of septic bacteria will inhibit an attack of anthrax for a few weeks, I certainly should object to speak of that as protective inoculation for anthrax.

12,265. (*Dr. Bristowe.*) Upon what evidence do you make the statement that the vaccination of a cow with vaccine lymph will protect it for a time from cattle-plague?—I said those were only some loose statements made by *Murchison*. I did not lay any great stress upon them.

12,266. (*Mr. Meadows White.*) You say you agree that an attack of small-pox will protect against future risks?—Yes.

12,267. And that that is the case also with scarlet fever?—Yes.

12,268. Is a second attack of scarlet fever more or less frequent than a second attack of small-pox?—I have no data as to that.

12,269. Or a second attack of measles more or less frequent than a second attack of small-pox?—I have no data as to that either.

12,270. Is there any generally accepted physiological reason why one disease is more protective against a second attack than another?—There is no accepted explanation.

12,271. It is simply a question of experiment whether the protection exists or not?—Yes, quite so.

12,272. Does not that bring the statistical argument in relation to vaccination into considerable prominence? Supposing the inference to be drawn from statistics is that there is not only a transient but a practically permanent protection in many cases, is not that a very important part of the matter?—Yes, no doubt; but it is generally accepted, I take it, in the profession and by the public that if you have once had measles or scarlet fever it is quite the exception to have that disease again; that is generally accepted; but there are several explanations of how that extraordinary immunity is produced.

12,273. The point I wanted to ask you was this: does not that bring the statistical conclusions in the case of vaccination into great prominence; supposing it is a proper inference from the statistics that there is a very general protection, would not that bring it into the same category as the cases in which you say there is a prophylactic effect in an attack of scarlet fever, or measles, or small-pox?—Yes, if they can be relied upon.



12,274. (*Dr. Collins.*) You would regard the protection afforded by an attack of small-pox against subsequent variolation as of a specific nature?—Yes, quite so.

12,275. Are there any facts showing a protection of the same kind or degree exerted by either inoculations of cattle-plague or sheep-pox against small-pox, as there are of variola against variolation?—Certainly not, that I am aware of.

12,276. So that any effect those two diseases might have you would put in the nature of an antagonism, and not protection?—Yes.

12,277. (*Sir William Savory.*) You say you do not understand the kind of protection that is afforded by one attack of small-pox against another; you do not understand what happens?—There are several views; but no one can definitely say what the mechanism of immunity is.

12,278. Can you say what is the mechanism of immunity in temporary antagonism?—No, but it occurs between certain diseases which are specifically distinct, and is of a very transient character.

12,279. If then you do not know what happens how can you say that there is a difference in kind?—From experiment and experience.

12,280. If you cannot in either case understand what happens, how can you speak of a difference in kind between the two?—One cannot explain how it is produced, but there is a very distinct difference. Take the case of anthrax. You inoculate with the bacillus pyocyaneus, and if you inoculate anthrax shortly afterwards, you find a tolerance of anthrax, but when the animal has recovered from the effect of the first inoculation it is just as susceptible to an attack of anthrax as if it had never been inoculated with the bacillus pyocyaneus. On the other hand, after an attack of anthrax the effect is quite different, for after complete recovery there continues to be immunity from a second attack.

12,281. But that is only repeating the fact, that is not explaining it?—We may not be able to explain it in words, but we can recognise the difference.

12,282. (*Chairman.*) Is there anything which leads you to say that there might be a difference in kind owing to the fact that one lasts for a time only while the other lasts for life?—Yes, and we know there must be some specific change which produces immunity, because the results are so regular and so lasting.

12,283. Passing from that branch, the next heading under which you desire to give evidence is variola-vaccine, what have you to say upon that subject?—I have already dealt with Woodville's experiments which, as I maintain, were cases of variola-vaccine, and I have also drawn the attention of the Commission to the results obtained by Adams and by Guillou. I should now like to draw attention to the experiments of Dr. Thiele, of Kasan, who apparently, without knowing it, worked upon very much the same lines, that is to say, not by the same methods, but he took small-pox lymph, diluted it with warm cows' milk, and then used it for inoculation, and after that lymph had been carried on through 10 successive generations, the result was the production of a vesicle with the classical character of the vaccine vesicle. This vaccine lymph was called lacto-varioline. The point I maintain is that this was not a production of cow-pox, but it was a complete attenuation of small-pox, and that this process was only variolation in an extremely mild form, and that the results were practically similar to the results obtained by Woodville, by Adams, and by Guillou. Then Gassner in 1801 inoculated cows, and from cows children, and produced a vesicle which could not be distinguished from the vaccine vesicle. Then in 1828 Dr. McMichael performed similar experiments. In 1830 Dr. Sonderland, of Barmen, performed experiments by which he claimed to have succeeded in converting small-pox into cow-pox. In spite of these experiments others entirely failed in attaining the same results. Experiments were tried by Macpherson and Lamb in India, and at Alfort, Berlin, Weimar, Bergen, Dresden, Kasan, Utrecht, and Stockholm, and on all those occasions they failed to convert or to reduce small-pox to the exhibition of a vesicle. But Dr. Thiele, of Kasan, in 1839 tried the inoculation of cows, and just before Dr. Thiele's experiments were published in this country, Mr. Ceely, of Aylesbury, succeeded in infecting calves. Now, Mr. Ceely being as admitted, very much influenced by the theory of Baron and by Sonderland's

aphorisms, conceived that when he had produced a vesicle upon the cow he had transformed small-pox into cow-pox. But I maintain that the vesicle which you will see depicted on Plate VIII. in my book was a *variolous vesicle*, and this is borne out by the result which followed in the case of Mr. Taylor, his assistant, who, in opening the vesicle pricked his finger and suffered thus: "On the fifth day there was a "papulo-vesicular elevation, surrounded with a dark "red areola, and much uneasiness in the part. In the "evening, headache and other febrile symptoms appeared, with roseola and fiery red papulæ on the face "and other parts. On the sixth day a more diffused "and lighter areola surrounded the less abrupt elevation, which was now more perfectly vesicular; the "constitutional symptoms increased, and the papulæ, "on the face, neck, trunk, and limbs, exhibited ash-coloured summits." But Mr. Ceely was so carried away with the theory of transforming small-pox into cow-pox that he looked upon this eruption as "evidently "modified vaccine in a sanguine habit, with roseola "and vesicular or vaccine lichen."

12,284. You conclude that that was a case of variola?—I conclude with Chauveau that that was a case of variola.

12,285. (*Professor Michael Foster.*) Chauveau regards it as a case of vaccinia, does he not?—No, excuse me, he does not. I have personally visited M. Chauveau. I have been all over his experiments, and have seen all his diagrams; we discussed the case together, and he told me he was convinced that Mr. Taylor suffered from small-pox.

12,286. Did M. Chauveau state it to you as his opinion that the vesicle upon the cow was a vesicle of variola?—I did not say that. I said that in his opinion Mr. Taylor had an attack of small-pox.

12,287. (*Chairman.*) That case was the source of a considerable number of vaccinations, or what were called vaccinations, but which you call variolations?—Yes.

12,288. In your view would the subjects of this kind of vaccination, of whom there were thousands, be protected as distinguished from those vaccinated with other lymph who would only have the benefit of a transient antagonism?—I think they would be protected for a time.

12,289. But why say "a time." I thought the distinction between the inoculation of the same disease and of one specifically distinct was, that the first gave protection as distinct from temporary antagonism?—Yes; I am convinced myself that in small-pox inoculation you have every degree from confluent small-pox down to nothing at all. Now before you arrive at the stage of producing nothing at all you may have so far attenuated the lymph that it produces only a vesicle which is no longer capable of giving variola and then we come to the question whether, when this lymph has been shorn of its variolous effects it is still to be called variola, and how long it protects.

12,290. But when by the attenuated variolation you produce only a temporary antagonism, how would you describe the difference between that temporary antagonism and the temporary antagonism resulting from vaccination?—When you produce from variolous lymph a vesicle shorn of its variolous properties I do not think there is any practical distinction, but the protection though very temporary is of the true specific kind. I am quite sure that one attack of natural small-pox protects against future attacks, and that small-pox inoculation protects against future attacks; but when small-pox is so far attenuated that it no longer produces specific variola, the results are not satisfactory, I am bound to say. To give an illustration, take Badcock's lymph which was used at Brighton, or Ceely's lymph, after it ceased to produce eruptions; it is not infectious; there is no tendency to produce variola.

12,291. You consider that lymph was variolous?—Yes, in its ancestry.

12,292. In the earliest cases of vaccination from that source, was there any distinction between the phenomena and the phenomena produced in the case of ordinary vaccination?—Yes, in some cases. For instance, there is this case of Mr. Taylor, and some of the children suffered extensively from vomiting, delirium, and extensive roseola; and these symptoms were much more marked in the hands of others who have tried the variolation of the cow. In 1836 Dr. Martin, of Attleborough, Mass., inoculated the cow's udder

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with variolous lymph, and by inoculating children from the variolated cow, produced an epidemic of small-pox. My view is that Ceely succeeded in very rapidly getting an attenuated virus; others were less successful. In 1839 Reiter, of Munich, inoculated a cow with small-pox; he inoculated a child from that cow, and produced modified small-pox. In 1847 they inoculated a cow at Berlin, but the children inoculated from that cow died of confluent small-pox. In 1864 Chauveau produced papules, but lymph from those papules produced fatal small-pox in children he inoculated. Fleming relates in India cases of inoculation of cows with small-pox, and children inoculated from the cows suffered from small-pox. Then we come to Voigt's experiments; he inoculated cows, and in some of the early removes from the cow there were suspicious symptoms indicating the variolous character of the lymph, but later on this passed off and ultimately only the local vesicle was produced.

12,293. (Professor Michael Foster.) The evidence of variola was very slight in that case, was it not, limited to the one that was taken from the second generation?—Yes, but still it was there.

12,294. And it did not go further than a few red spots on the body, and was not accompanied by any "Pockenfeber," and therefore was judged by Voigt himself not to be in any way small-pox. I am reading from his original account?—He says that though no variolous eruption appeared, "yet the six pimples were "no common vaccinal symptoms."\* Voigt's own explanation is this, you may inoculate a cow with variola and produce a variolous vesicle; from that vesicle you may, when you inoculate children, produce again variola or you may not; in any case if you carry on that lymph through another cow and another cow you so far attenuate it that at last you only produce the phenomena of vaccination.

12,295. (Chairman.) What has it become, then?—It is variolous in its ancestry, but it ceases to be variola just as sheep-pox when inoculated in man ceases to be sheep-pox; in fact, my conclusion is that from sheep-pox, horse-pox, cow-pox, cattle-plague, small-pox, and perhaps goat-pox, we can by inoculations upon the human subject produce certain phenomena which we recognise as the phenomena of vaccination, but I do not admit that that proves that small-pox was converted into cow-pox, because upon that theory you would have to say that sheep-pox was converted into cow-pox, and that cattle-plague was converted into cow-pox.

12,296. (Mr. Pieton.) You cannot tell from the appearance of the vesicle what was the source of the lymph?—Not with certainty; but, as you have heard, the cattle-plague was given up; the goat-pox we know very little about, so that the lymphs we are reduced to in this country are horse-pox, cow-pox, and variolous vaccine such as Badcock's and Ceely's.

12,297. (Sir James Paget.) The effect of those cannot be distinguished, can they?—They can, by careful comparison. Estlin says so, and Ceely says so, but practically they cannot.

12,298. They are no more different from ordinary examples of vaccination than ordinary examples of vaccination are from each other?—That is so.

12,299. I think you said just now that small-pox itself could be so attenuated by repeated inoculations as to be no longer a protection?—I did not give quite such a definite statement as that. What I said was this: that when the lymph was shorn of its variolous properties, that is to say, in the sense of producing eruptions, or being infectious, I must confess that in the use of such lymph the results are unsatisfactory; but the only evidence I have of that is the evidence given on pages 505 and 506 of my second volume; and I should like to put a copy of that table in as showing the application of the variolous test after Ceely's variolous vaccine; that is to say, after it had been some time in use and no longer was capable of producing variola. (The paper was handed in. See Appendix I., page 412.)

12,300. Was this the variola vaccine from the cow?—Yes.

12,301. Which had been inoculated with small-pox?—Yes; Ceely gave some lymph to Marson, and Marson

inoculated one case, soon after vaccination without any local or constitutional result. That was Marson's statement, but Ceely's own experience was very different. He inoculated 21 cases, and in every one of those cases the result that was produced was practically what they were satisfied with in the days of inoculation, that is to say, a papulo-vesicular eruption on the arm, and in one case not only was there the vesicle on the arm but hard warty papulæ on the face, trunk, and limbs, several of which suppurated.

12,302. How long after the vaccination were those inoculations made?—At various periods. Several were five months after; they vary from five up to 31 months. On the first page they are nearly all five months after vaccination. Now, I look upon Woodville's lymph which produced a genuine attack of small-pox as definitely protecting when the variolous test was applied, and I put in Ceely's table as showing that when you so far tone down your small-pox lymph that it only produces a vesicle and nothing more, the evidence is not so satisfactory.

12,303. (Dr. Collins.) Has there been any variolous testing of any vaccines, since the time of Ceely and Marson, in this country?—No, because it is an offence.

12,304. What did they do then?—On page 504 of the second volume of my book there is a footnote, in which you will see that Ceely says, "not only the limpid and adhesive lymph of these "test" varioloid vesicles will produce variola by "inoculation; but that the fever, though slight and "fugitive, which sometimes attends such "testing" is "occasionally specific and infectious"—we cannot eliminate those cases as being merely local pustule; we have the pustule, we have the fever, we have the eruption, and we have lymph taken from those vesicles producing variola—"But these warnings now," adds Ceely, "are needless; the 3rd and 4th Victoria, chapter "29, will doubtless altogether supersede them," that is to say, the Act prevented any further inoculation of small-pox.

12,305. (Professor Michael Foster.) Which are the cases in which there was a fever of eruption? I am speaking of the table on page 505 of your book, a copy of which you have just handed in?—At No. 11 he mentions fever.

12,306. Therefore we may infer that fever was absent from those in which it is not mentioned?—That is an inference.

12,307. (Dr. Bristowe.) The absence of fever means the absence of marked fever; may we take it?—No doubt.

12,308. (Professor Michael Foster.) Would Sutton have been satisfied with an inoculation which did not produce the fever of eruption?—I think not; but Dimsdale would have been satisfied with those conditions.

12,309. Dimsdale would have been satisfied without the fever of eruption?—Yes.

12,310. Without any significant eruption or fever showing the system to be affected?—Yes. I gave cases. (See Appendix I., page 398.)

12,311. (Dr. Bristowe.) The absence of fever means, of course, the absence of marked fever; because at that time they did not employ the thermometer to ascertain different temperatures of the body?—Quite so.

12,312. So that there might be a difference of a degree or two which the physician would not have recognised?—Yes, quite so; there might have been fever in all those cases.

To sum up; the conclusion that I have supported in my book is that the variola-vaccine is small-pox, and M. Langet in the "Dictionnaire Encyclopédique des "Sciences Médicales" quite agrees with the view I have given, and that Ceely's are cases of modified variolation. Then I should like to direct the attention of the Commission to the case of Taylor; from the description it is very suspicious of small-pox, but Ceely describes it as vesicular or vaccine lichen; now it is very interesting that he uses almost the same expression in speaking of a case which he admits to be small-pox, because in describing that Case 5 (in the table a copy of which I have handed in), which almost exactly corresponds with the description given of that case of Taylor, he says "the greater part of the "eruption resembled the vesicular lichen occasionally "seen after vaccination;" so that I think that tends to support my view; because this was a communication made some time after that case of Taylor.

\* After referring to Reiter's variola-vaccine Voigt says, "It is "evidently a serious thing to use it in the first generation, for, as in "the Eastern inoculation, varioloid might be produced . . . I should "not be astonished if the lymph of such pustules should still contain "after five or six days unchanged germs of variola, germs which later "on after repeated passages through animals would assume a milder "form and become modified."—E.M.C.



12,313. (*Professor Michael Foster.*) May I ask you, with regard to the Badcock lymph, at what stage in the history of the lymph it became so attenuated as to be shorn of all its really variolous matter?—I think in the very first experiments he performed; and I attribute that to the fact that the inoculation on the cow was performed, if I remember rightly, from a mild case of small-pox; at any rate, whether that is so or not I think the result depends a great deal upon the character of the small-pox from which the lymph is obtained.\*

12,314. That Badcock's lymph was attenuated because it was taken from a mild case of small-pox?—So quickly attenuated.

12,315. So that from the very first, directly it came off the vesicle on the cow, it was wholly shorn of what you call its variolous matter?—Yes.

12,316. Then you attribute that to his having taken mild cases for inoculation on the cow?—Yes.

12,317. He was successful in more than one case?—Yes.

12,318. He distributed his lymph not only in one but in several cases?—Yes; but we have no particulars of his other experiments on the cow. I tried to get the particulars of the experiments, but I could not get them.

12,319. As regards the second case that he did, he says, as I am told by Mr. Hodgson: "The supply was so excellent that I used it as a source from which I propagated vaccination upon the large list of patients from this page" (in this little book he published) "forwards;" something over 2,000 persons?—That is what one would expect.†

12,320. He was singularly successful in using mild lymph to start with?—Yes; and other observers were not all so successful, they had only the vesicle, when they had carried on the lymph through several removes; and Voigt says that some failed because they ought to have carried it on through successive generations before they applied it to children.

12,321. You know what Chauveau's explanation is of the vesicle?—His view is that they really variolate, and that is the view accepted by M. Langet and M. Layet, and other authorities in France.

12,322. Are you aware that in his last published statement he regards it as the vaccine vesicle?—He does not do so now.

12,323. Where is the publication in which he has not done so?—I have already said that that statement was from conversation with him.

12,324. He had not abandoned that view in his letter to me of so recently ago as at least a year; in a correspondence which I had with him he still adhered to the view that those vesicles were essentially vaccine vesicles, the contents of which were possibly mixed to a certain extent with small-pox?—He may have given me a wrong impression, but he produced that diagram of Ceely's I have given in my book, and drew my attention to the giant vesicle, and drew my attention to Mr. Taylor's case, to prove that variola was produced from that vesicle. I have not said in my book that Chauveau looked upon the vesicle of the cow as a variolous vesicle and nothing else; but he certainly, from drawing my attention to the fact that it communicated variola to Taylor, gave me the impression that he considered that it was variolous.

12,325. He regards it as a vaccine vesicle, the contents of which were, or might be, mixed with variola, and he compares it to a case which occurred in his experiments on inoculating on the cow simultaneously with variola and vaccinia?—If I saw M. Chauveau, I would ask him to explain those cases in which a vesicle was produced, and in which there was no possibility of contamination with cow-pox, as, for example, in Badcock's case.

12,326. The only explanation he can offer in these cases is an explanation similar to that which you offered in the case of Woodville, that the lancet was unknowingly contaminated with vaccine?—That I discussed with him, but there is no evidence that Badcock

used the same lancet upon every occasion; he variolated a large number of cows.

12,327. He variolated a large number of cows and had successes in only 27 cases, it was at first stated 31, that is subsequently corrected to 27, in 27 out of 200 animals. I do not know whether you remember the remark of Chauveau with regard to Ceely's case in particular, and the evidence he brings to bear that the one puncture which became the vesicle was probably the first puncture made by the lancet, therefore if the lancet were contaminated that would be more likely to bear the fruits of that contamination than any of the succeeding ones?—I cannot accept the explanation that on every separate occasion on which Badcock succeeded he must have used lancets contaminated with cow-pox. In Voigt's experiments it is true that variola and cow-pox were inoculated simultaneously, but on parts of the body of the calf distant from one another.

12,328. How many times does Voigt succeed; did he succeed more than once?—There were several experiments, with only one complete success, but then, again, we have the reports of other observers, which I have already given, who did not simultaneously use vaccine.

12,329. That is not the question; it is not a question of the simultaneous inoculation of variola and vaccinia which took place in Ceely's case and also in Voigt's; it is that in making the puncture from which the vesicle in question was produced, the lancet used may have contained upon itself some vaccine matter?—Then how can you possibly explain the cases in Egypt where they had no vaccine matter, and yet produced "vaccine" by inoculating cows with small-pox?

12,330. Whose cows were those?—Dr. McMichael's.

12,331. (*Chairman.*) Where are those cases reported?—They are referred to in the Transactions of the Medical Association.

12,332. (*Professor Michael Foster.*) There is a complete absence of any reference to vaccine?—Yes, that is the evidence; they had no vaccine at all when they performed these experiments.

12,333. (*Dr. Collins.*) I understood you on the last occasion to give the Commission your opinion that Woodville's variolous tests practically only prove what had been known before; that inasmuch as his patients had previously had small-pox they resisted variolation; is that so?—Yes, that is my view; at any rate they have to be eliminated as cases of evidence of the protective power of cow-pox. I should like to be clear upon that, my objection is that these cases are being constantly referred to as evidence of the protective power of cow-pox.

12,334. I understand the table you have put in to-day of Mr. Ceely's in which 21 variolous tests were applied as dealing with the lymph which you hold to have been at any rate variolous in its ancestry?—Yes.

12,335. Can you refer the Commission to any variolous test either about that time or earlier in the century upon a large scale in which the lymph employed was undoubtedly of cow-pox ancestry?—No.

12,336. (*Mr. Picton.*) You told us just now that there were three strains of lymph in actual use at the present time, one of which is of variolous origin?—Yes.

12,337. That originated from Badcock?—Yes, from the inoculation of a cow.

12,338. Do the effects ever recur; do they ever show a reversion to small-pox?—No; that is why I hesitated in my answer as to what we should call it; whether we were still justified in speaking of it as variola although it is of variolous ancestry.

2,339. (*Dr. Collins.*) Can you distinguish any difference between temporary antagonism which may result from the use of such lymph, which you call variolous vaccine as used by Ceely and Badcock, and that which might result from the use of sheep-pox or cow-pox vaccine?—We have nothing by which we can really compare the one with the other; we have only a few isolated statements.

12,340. (*Chairman.*) Were the phenomena in those cases of Ceely the same as in the cases of cow-pox?—No, I think there is a striking difference, if you look at the drawing, between the two vesicles. As we are referring again to that drawing I should like to point out that M. Chauveau suggested on one occasion when we talked over the subject, that possibly that great vesicle was the first inoculation made; but I remember saying

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\* Voigt succeeded in one case and the lymph used for inoculation in the calf was obtained from a case of varioloid.—E.M.C.

† Seaton says, on page 61 of his "Handbook of Vaccination": "The hundreds of practitioners who in England have for nearly 30 years been using Ceely's or Badcock's lymph, must learn with extreme surprise that all this time they have not been vaccinating, as they supposed, but actually unconsciously variolating, their patients! . . . It seems difficult to treat as serious this hypothetical suggestion of M. Chauveau." In my opinion Chauveau was right and Seaton wrong.—E.M.C.



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to him at the time that if that was a pure vaccine vesicle how was it that it was so distinct from the other vesicles which were known to be vaccine.

12,341. You mean from the other vesicles of natural cow-pox?—No, from the vaccine vesicles on the opposite side of the vulva.

12,342. But what I am speaking of is the difference between the phenomena exhibited in the case of the inoculated variolous matter and in the case of natural cow-pox?—Yes, there is a difference, although as I have already pointed out, it is so very difficult to see the eruption of natural cow-pox in the vesicular stage.

12,343. (*Dr. Collins.*) In the later stage is there not a considerable difference?—Yes.

12,344. Is there any tendency to phagedenic ulcers in the case of the inoculation of variolous matter on the cow?—No.

12,345. Is there in the natural cow-pox?—Yes.

12,346. (*Sir James Paget.*) But were these cows kept perfectly quiet after being milked every day?—I see your point, but the evidence upon which I question whether ulceration is altogether due to the hand of the milker is that I have seen cow-pox in cows all milked by the same milker, yet the animals suffering in very varying degree from ulcers. And ulceration which occurs in horse-pox is not accidental and the explanation of the milkers inapplicable.

12,347. Have you seen any one in which there was only a single vesicle remaining after repeated milking?—I have only seen them in the condition in which the vesicles have been broken almost immediately.

12,348. Therefore, there would be a strong contrast to be expected in the case of inoculation where the animals were carefully kept from all friction and other injury, and the case of cows that were regularly milked?—Possibly one would have to do fresh experiments with that in view, certainly the tail of the animal might keep the vesicles upon the vulva in a state of friction, but that would not account for ulceration in the generalised eruption of horse-pox. Look again at Plate VIII., facing page 298 of the first volume of my book; I think there is a great difference between the vesicles. If the one on the left was a vaccine vesicle, and was the first one done, how is it that the others on the right are not of the same character?

12,349. (*Chairman.*) Would you say that each of those upon the plate was so typical that all others were like them?—Yes, I think those are very typical vesicles indeed.

12,350. But as to the variolous vesicle, what do you say?—I have seen a great deal of vaccination upon the calf, more in France than in this country, both with horse-pox and cow-pox, but I have never seen a vesicle which resembles that variolous vesicle.

12,351. (*Dr. Bristowe.*) First of all I want to go back to a question you have already answered. In reply to Mr. Picton, I think you said that there was proof that cattle-plague could produce vesicles like those of cow-pox, which could be perpetuated; you also stated that no such proof existed as regards Europe, and that the only proof came from Asia?—Yes, from India.

12,352. In the case of Hancock you admit that it was a post-mortem wound and not, therefore, a true inoculation of cattle-plague?—It was inoculation with the virus of an animal suffering from cattle-plague.

12,353. With exactly the same kind of result as may arise from a wound at any post-mortem examination, and such as does constantly happen to students and others, who infect themselves at post-mortems?—Possibly.

12,354. (*Dr. Collins.*) Was that Ceely's opinion?—No.

12,355. (*Dr. Bristowe.*) You admit that Badcock and others inoculated small-pox on cattle?—Yes.

12,356. You admit that that imparted to them a disease which resembled cow-pox in appearance, but which coming from small-pox is shorn of the infectious qualities of small-pox?—Yes.

12,357. And that this can be transmitted from cows to human beings perpetually?—Yes.

12,358. So that in that way, derived from small-pox through the cow, there is a strain through the country of so-called vaccination which is indistinguishable from other vaccination, and which is a derivative of small-pox, and is an attenuated small-pox?—Yes.

12,359. Presumably therefore that would have some specific influence with respect to future attacks of small-pox upon those who had been inoculated; it would not be reasonable to suppose that it would not have such an influence?—It may have such influence.

12,360. You have no evidence that this particular strain has not a very definite influence?—Yes, I have; Ceely's own tests.

12,361. I am talking of Badcock's?—There is no difference between them.

12,362. You admit in your book that from Badcock's inoculations there is a very widely spread strain of cow-pox which is still widely perpetuated?—I would rather say "the phenomena of vaccination." I do not admit that it is cow-pox.

12,363. You do admit, I suppose, that something which resembles cow-pox derived from small-pox was perpetuated to a large extent in the neighbourhood of Brighton and elsewhere, which still continues as a strain of so-called cow-pox?—Yes.

12,364. (*Dr. Collins.*) I understand you to prefer the word "vaccine" to "cow-pox" in that connexion?—Just so, still I give way to Dr. Bristowe.

12,365. (*Chairman.*) "So-called" is accurate, is it not?—Yes.

12,366. (*Dr. Bristowe.*) I am quite willing to say "vaccine." Now you have no proof, have you, that cow-pox is not derived from small-pox, you have stated that it is a disease *sui generis* belonging to cattle, but you can give no proof that it is?—We have no proof.

12,367. So that it is possible it may be small-pox conveyed to the cow equally with its being a disease of the cow conveyed to human beings; there is no proof, is there, one way or the other?—We have no evidence of the former.

12,368. Judging from Badcock's experiments, and judging from the fact that cow-pox, as we know it, is conveyed from one cow to another by human hands, and does not spread from cow to cow directly, does it not almost necessarily follow that the disease is small-pox attenuated?—Then we must also admit the same of sheep-pox and cattle-plague.

12,369. Not cattle-plague?—Yes, because it will produce a vesicle of the character of the vaccine vesicle.

12,370. I have been talking of small-pox?—I cannot confine myself to a narrow channel. However, in answer to the question I would say your theory is unsupported by any evidence that we have.

12,371. Have you any evidence the other way?—Yes, but of course we cannot prove a negative and we cannot prove the origin of a disease any more than we can prove the origin of species.

12,372. We have very powerful evidence that you can introduce small-pox into a cow and produce the disease we know as cow-pox?—You must measure that evidence by the facts of De Paul, who produced a vesicle like cow-pox from sheep-pox—

12,373. But I am confining my attention to cow-pox and small-pox?—I do not think in discussing these questions we should confine our attention to isolated facts.

12,374. (*Chairman.*) Is there any accurate description of the vesicle produced in those Indian cases from the crust taken from the cows having cattle-plague?—I am not aware of any detailed description, beyond the fact that they could not distinguish them from the ordinary vaccine vesicle.

12,375. Who says that they were indistinguishable from the ordinary vaccine vesicle?—Dr. Macpherson and Mr. Furnell.

12,376. They state that?—Yes.

12,377. (*Dr. Collins.*) There have been a good many investigations during the last year or two, instituted by the Agricultural Department, I believe, into outbreaks of cow-pox in this country, have there not?—Yes.

12,378. And has there in any single instance been found a connexion between a milker suffering from small-pox and a cow suffering from cow-pox?—No.

12,379. (*Professor Michael Foster.*) You say that that vesicle of Ceely's is not a typical vaccine vesicle and you contrast it with the undoubtedly vaccine vesicles on the other side?—Yes.

12,380. Still it was recognised by Ceely and everybody else as a vaccine vesicle?—Because they were not



aware that such a vesicle could be produced by small-pox without going through the cow at all.

12,381. And in Badcock's case those differences which were observable in Ceely's were wanting?—Yes.

12,382. Badcock's cases were spoken of in his little pamphlet as "a perfect vaccine vesicle"?—Yes, at the same time, as I have pointed out, we must remember what their prejudices were, and how they were influenced in believing that they could convert one disease into the other, that is admitted by Ceely himself.

12,383. (*Mr. Hutchinson.*) Have you made any collection of cases illustrating the shortest period of protection by vaccination from small-pox, that is to say, an occurrence of small-pox in how short an interval from vaccination?—Yes, from general reading: one finds, for instance, illustrations in Steinbrenner who has practically given an encyclopædic account of the statistics from the earliest times. Apart from the variolous tests take for example Ludwig, who after very great experience said that he considered that the protection was far more transient than we have ever been led to believe, namely, four years. Dr. Gibson had 251 cases of small-pox, and by far the greater number of them had been vaccinated less than two years.

12,384. What is the shortest period of any well-authenticated case within your knowledge?—I have not gone out of my way to collect such particulars, but one is struck in one's general reading by the number of cases quoted by the early writers of the occurrence of small-pox a few months after successful vaccination.

12,385. (*Sir James Paget.*) Do they give distinct evidence of the vaccination having been successful?—Yes, that is expressly stated because of the way in which cases were always explained away; when a number of cases of small-pox after cow-pox were reported the fact was at once explained by saying that they could not have been successfully vaccinated, or it was "spurious" lymph, or the protective power of the lymph was temporarily suspended or they were cases of malignant chicken-pox. Brown of Musselburgh maintained that his cases were successfully vaccinated.

12,386. (*Professor Michael Foster.*) Do you know the shortest time of the occurrence of small-pox after small-pox?—It may occur very shortly a few weeks in some cases.\*

12,387. (*Mr. Hutchinson.*) You will admit that those very short intervals are very exceptional in vaccination?—I do not think they are so infrequent as may be generally thought. In the outbreaks in Scotland there were a very great number of cases, but they were put down as malignant chicken-pox, whereas it was acknowledged some time afterwards that they were cases of small-pox.

12,388. What were the intervals in those cases?—The intervals in those cases were a few months to two years.

12,389. No doubt you know it is the practice to vaccinate the nurses going into small-pox hospitals?—Yes.

12,390. Can you give the Commission any facts of cases in which that has failed to protect, that is to say, nurses being vaccinated before they were exposed and then going into a focus of contagion?—Yes, I have been very much impressed by that. I was very much struck by reading Colin's work upon small-pox in which the evidence is very striking as to a number of attendants in the small-pox hospital at Paris. Colin was a great believer in the necessity of re-vaccination. Out of 200 attendants nearly all were re-vaccinated under his eyes, and 15 of them were attacked with small-pox, with one death.

12,390a. Was the operation performed immediately before?—It must have been shortly before. On the other hand, it is very curious (he remarks upon it himself), that among 40 doctors and chemists, and 40

nuns, nearly all of whom refused to be re-vaccinated, there was not a single case of small-pox.

12,391. Is there any information as to whether those doctors, chemists, and nuns refused because they had been re-vaccinated within some recent period?—Yes, because Colin is insisting upon the necessity of re-vaccination, and expressly states that they had only been vaccinated.

12,392. They had all been vaccinated at one time, it was only a question of re-vaccination?—We may conclude that they were not re-vaccinated, because Colin, an ardent supporter of re-vaccination, draws attention to the fact that the 40 doctors and 40 nuns neglected re-vaccination, and he also draws attention to the fact that the 200 attendants were re-vaccinated under his eyes.

12,393. What is your inference from the fact that the doctors did not take it?—The evidence is very conflicting.

12,394. Is it an unreasonable inference that they were protected, either that they had had small-pox before, or that their vaccination gave them some protection?—It is difficult to accept that when we have out of 200 who have been vaccinated and re-vaccinated, 15 cases of small-pox. On the other hand, if the doctors had previously had small-pox, any or all of them, Colin would have been the first to mention it.

12,395. I take it that you will admit that there is a great difference in the individual constitution as to the period of protection which any specific fever gives, that that period lasts much longer in some than in others, one would think that was a very well-marked distinction?—Yes, as an individual exception, but not upon so large a scale as this.

12,396. You are aware of the fact no doubt; I think it is established by statistics, that medical men do not take small-pox easily although they are so much exposed to the risk?—That is no doubt a fact; when I was reading the early literature of this subject I was surprised that I could not find any great mortality from small-pox amongst medical men even in pre-inoculation days.

12,397. Are you aware of any comparative statistics in pre-vaccination days?—I am not aware of any statistics existing on that point, it is only from my general reading that I speak.

12,398. You know of Dr. Ogle's statistics, collected after vaccination, showing their comparative immunity?—Yes, I am aware of those statistics.

12,399. They show very strongly the comparative immunity of medical men although exposed to contagion. Now, if you had the management of a small-pox hospital and were going to admit nurses into it, should you regard it as a measure of prudence to have them vaccinated or not?—I should "vaccinate" them, but not with cow-pox or horse-pox. I should use variola, especially after Colin's experience.

12,400. (*Chairman.*) With reference to cattle-plague you said that Dr. Duncan Stewart stated that the vesicles produced by the inoculation of cattle-plague were indistinguishable from ordinary vaccine vesicles. I find at page 326 of your book that Dr. Duncan Stewart (I take it from what immediately precedes) is quoting from Mr. Brown when he makes the statement: "In all four, vesicles in every respect resembling in their progress and when mature genuine vaccinia, made their appearance, and went the same regular course." That seems to be a quotation from Mr. Brown?—No; that is a quotation from Dr. Duncan Stewart's report.

12,401. It is from Dr. Duncan Stewart's report, but those words in Dr. Duncan Stewart's report you will observe, if you look at the top of the page, are in themselves a quotation?—Those two paragraphs on the top of page 326 ought to have been distinct. The first paragraph is quoted from the Quarterly Journal of the Calcutta Medical Society, and the second paragraph is from a report on small-pox in Calcutta.

12,402. But the statement is made about certain four specific cases, those were, as I gather, four select cases of Mr. Brown's?—Yes.

12,403. There seems to be a question as to their character, whether they were not variolous?—There are two views; the eruption may have been a cattle-plague eruption, or there may have been variola super-added.

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\* "That children and adults comparatively recently vaccinated with humanised lymph, and some showing good marks, may subsequently within a few days, months, or years contract small-pox is an undoubted fact probably known to all of us. Now many of these sufferers showed good vaccine marks of the kind that would be deemed worthy of an extra grant from the government inspector (at least I used formerly to receive such grants for doing similar looking work) and yet they took small-pox—some within six days, some within six months, and some within six years of their vaccination date. I would ask what inference can fairly be deducted from this record, except that they had been vaccinated with lymph of enfeebled protective power."—*Dr. Browning, Trans. Med. Off. of Health, 1881-1882.*—E.M.C.



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12,404. I should like to know whether in other cases where there was no question of variola there is a description of the vesicle as being exactly similar to the ordinary vaccine vesicle; there does not seem to be any in your book?—Yes. Mr. Macpherson says (page 321): “Five children were vaccinated from those just mentioned, and the result was equally successful, after which no difficulty was experienced in disseminating the disease.” He also says above that one child’s arm “was slightly inflamed on the fourth morning, and a vesicle was apparent the next day, which continued to increase till the ninth day, when I was much gratified to find that it assumed all the characteristics of true vaccine.”

12,405. That is a different thing. According to you he was inaccurate in his supposition that this disease of the cow, which was the origin of his experiments, was cow-pox; it was really another disease?—It was really another disease; he was led to do these experiments from Baron’s saying that cow-pox was cattle-plague.

12,406. It is not as if we had a specific description which would enable us to say with certainty that the vesicle was precisely the same. We have neither a picture of it nor a statement that it was indistinguishable in its character?—It is distinctly stated that it assumed the character of the true vaccine.

12,407. It did that upon the ninth day, apparently, not previously. I should like to ask you this, in your view is the cattle-plague eruption of the same character as the variolous eruption?—There is a general resemblance in certain stages, but it is not so close as Murchison would have had us believe, but the very fact that the natives of India always spoke of it as *mhata* or small-pox, shows that there is a resemblance.

12,408. What do you say to Macpherson’s experiments in 1837, which, so far as there is anything here to indicate, were experiments made with the same disease of the cow which you say is cattle-plague, why in those cases was there “an eruptive complaint of the true variolous nature” [page 326 of your first volume]?—I am obliged to leave that statement to stand. I have looked very carefully for the records of those cases, and I cannot find them. I am inclined to think that Baron made a misquotation, and was really referring to Furnell’s cases. I cannot find any further reference so I have simply allowed it to stand for anyone else to follow up the point.

12,409. And also Wood’s in 1838?—Of those I can get no record beyond that extract.

12,410. You say [page 326] “From all these independent observations, if we accept them as correct, there would seem to be no doubt that cattle-plague virus inoculated in the human subject will produce a vesicle with the physical characters of the vaccine vesicle, and succeeded occasionally by an eruption which appears to have the characters of the eruption of cattle-plague.” They seem to speak of it as having the character of the eruption of variola?—Quite so, but Mr. Furnell was inclined to eliminate variola as an explanation of the eruption. I am inclined to think, on reading some of the further evidence, that that must be left an open question; whether the eruption was produced by engrafting cattle-plague, or whether it was that the children were exposed to small-pox in the village, and that that was superadded.

12,411. (Dr. Collins.) I suppose if the appearances in Mr. Hancock’s hand were the result of septic inoculation, the results of septic inoculation must strikingly resemble the vaccine vesicle if Professor Spooner and Dr. Murchison considered it to be the vaccine vesicle?—No doubt.

12,412. Mr. Hutchinson was asking you whether there were authenticated instances of small-pox following shortly after vaccination, may I ask you whether you remember this statement by Badcock: “Towards the end of the year 1836, I suffered severely from a dangerous attack of small-pox, which happened but a few months after re-vaccination”?—Yes. I would not attach importance to individual cases, but at that period, according to Badcock and to Estlin, the public and the profession had almost abandoned any belief in the protective power of vaccination, because of the numerous cases they had.\*

\* Estlin said, “On the diminished anti-variolous power of the present stock of vaccine matter I need make no remark; the public are too painfully aware of the fact.” Badcock was impressed “with an idea that the old vaccine had lost its protective influence by passing through so many constitutions.”—E.M.C.

12,413. (Mr. Hutchinson.) You took us abroad as to the point of nurses in small-pox hospitals being vaccinated, have we no statistics in the English hospitals?—There are Marson’s cases, but I should like to refer to them as an illustration of how necessary it is to get at the back of all the facts before coming to any conclusions. If the immunity was really due to that we cannot say that that is proof of the efficacy of cow-pox, because we find that Marson used Ceely’s variola-vaccine.

12,414. You would admit that vaccination as generally practised does protect many?—Yes; for a time.†

12,415. Do you admit that vaccination as now practised does in a good many instances protect the individual throughout the whole term of his life?—I do not admit that any form of it does.

12,416. Suppose a person has been repeatedly exposed to the contagion of small-pox during his life, is that at all a fair test of his being protected?—I would not attach importance to individual cases.

12,417. Supposing in any case an individual is freely exposed, that he goes into the small-pox hospitals freely, and never takes the disease, is that any evidence that he is protected?—Not necessarily; nurses may catch small-pox after leaving a small-pox hospital. I think we must take into account the condition of the hospitals of the present day. We should also take into account Haygarth’s experience of immunity from typhus.

12,418. But there is no immunity from typhus?—Not according to some statistics; but there again I should have to go into the circumstances under which those statistics were taken, for Haygarth says: “As safety from danger entirely depends on cleanliness and fresh air the chamber door of a patient ill of an infectious fever, especially in the habitations of the poor, should never be shut; a window in it ought to be generally open during the day, and frequently in the night. Such regulations would be highly useful, both to the patient and nurses; but are particularly important previous to the arrival of any visitor. Among the middle and higher ranks in Chester and its neighbourhood during a period of 31 years I scarcely recollect a single instance of the typhus fever being communicated to a second person, not even during the epidemics of 1783 and 1786, which excited a general alarm in that city. Fresh air and cleanliness were the only means which I employed to prevent infection.” I am quoting this to show how important it is not to be misled by statistics, because we cannot eliminate evidence like that, even if some statistics indicate the contrary. In another place he says, “Sir William Watson informed me that in St. Thomas’ the three physicians I studied under all fell victims to hospital fevers—to wit, Drs. Okenside, Russell, and Grieve, and Mr. Waring, surgeon”; but Dr. Saunders, who confirmed these facts, assured Haygarth that “no physician or surgeon in Guy’s Hospital for upwards of 30 years has suffered by a typhus or contagious fever.” He explains this difference in a very judicious and satisfactory manner so as clearly to confirm the doctrine advanced in this letter. “The room in which the out-patients were prescribed for was of a very small dimension and extremely crowded at St. Thomas’ Hospital. The room for the out-patients at Guy’s was large.” Haygarth concludes: “As the cause of these calamities is so fully explained, and as the means of preventing them is so obvious and easy, I hope that no physician, surgeon, or medical student will ever in future be infected with a typhus fever in a hospital.” He also says that visitors never, and nurses seldom, were infected in the Chester fever ward. “At the commencement of this institution at Chester apprehensions of the danger of infection were so prevalent that no nurse could be persuaded to attend the fever wards. In these difficulties a

† To prevent any erroneous interpretation of this reply I wrote before the next sitting, pointing out to his Lordship and the Commissioners that I understood Mr. Hutchinson (following up Question 12,413) to be referring to *variola-vaccine*. Woodville’s experiments proved that *variola-vaccine* was protective, but I insist upon it that Ceely’s test experiments (see Appendix I, page 412) showed conclusively that *variola-vaccine* when no longer capable of producing small-pox, could not be depended upon to afford protection for even five months. And as for cow-pox lymph, horse-pox lymph, cattle-plague lymph, or any other kind of “vaccine-lymph,” I have repeatedly pointed out to the Commissioners that any effect upon small-pox, if such exist at all, is a very transient antagonism, and not a specific protection. Dr. W. Budd has expressed a similar belief with reference to sheep-pox: “There is, indeed, evidence to render it probable that for some weeks after vaccination, sheep are somewhat less prone to take *clavelée*—sheep-pox—in the natural way; but there is clearly nothing specific in the protecting influence. Louis has remarked that typhoid fever hardly ever occurs in persons who may at the same time be the subject of any other morbid disturbance.”—E.M.C.



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"surgical patient was prevailed on. He caught the fever and died of it." Three other cases of nurses are given: "But as far as has come to my knowledge, these four are the only instances of infection communicated in the fever wards in Chester during a period of 14 years and a half, from August 1783 to March 1798. Both these nurses were susceptible of fever. They both exposed themselves to infection without reserve, even more than was necessary and useful, especially the former. No medical or other visitors were ever suspected to have caught infection in these wards, though they have touched the patients in innumerable instances."

12,419. (*Sir William Savory.*) Can you produce to the Commission any evidence either from at home or abroad where attendants in a small-pox hospital who had neither been vaccinated nor had small-pox, have escaped small-pox?—Except in exceptional instances they would all have been vaccinated in infancy.

12,420. (*Chairman.*) Your next point has reference, I believe, to the question of the efficacy of isolation?—Not to isolation only, but to a system of prevention which can be fully relied upon to protect the community from small-pox. May I be allowed to state that I trust, as the outcome of this Commission, the Government will enter into negotiation with the Governments of other countries for the purpose of establishing some international understanding on the subject of measures for the prevention of such preventible diseases as small-pox? Possibly this could be attained by appointment of an International Board of Health. In any case I think the system of notification and isolation should be an international one. If no concerted action can be agreed upon with the Governments of other countries, our consuls might be instructed to give immediate information as to the existence of such diseases as cholera and small-pox. I would impress upon the Commission that, as regards the prevention of imported diseases, we take more care of our live stock than we do of ourselves. We cannot, it is true, in the case of human diseases employ the stamping out system in the sense of slaughter of the infected, but we ought at any rate to legislate to prevent the importation of small-pox, and to ensure notification and prompt isolation should any isolated case get access to the country. To prevent importation the duties of a Central Health Office, presided over by a Minister of Health, should include the collection of all information as to the existence of outbreaks of communicable diseases which might be imported, and regulations should be in force similar to those which are from time to time proposed in cases of emergency. Thus, for example, as regards the importation of rags from any place suffering from small-pox, I would apply the regulations which have been recently enforced on the plea of the prevention of cholera. Thus: "Whereas [small-pox] is now prevalent in certain parts of . . . , and it is expedient that regulations should be made as herein-after mentioned with reference to ships having on board bales of rags from that country—we, the Local Government Board, by virtue of the authority vested in us, make the following regulations: From and after . . . and until . . . no rags from . . . shall be delivered oversea, except for purpose of export, nor landed in any port or place in England or Wales. If any rags shall be delivered over-side or landed in contravention of this order, they shall, unless forthwith exported, be destroyed by the person having control of the same, with such precautions as may be directed by the Medical Officer of Health or the Sanitary Authority in whose jurisdiction or district

"the same may be found. All masters of vessels, consignees, or other persons having control of any rags prohibited under this order from being delivered, except for the purpose of export, are required to obey these regulations. All officers of Customs are empowered to prevent the delivery of rags in contravention of this order. It shall be the duty of the Sanitary Authority to take proceedings against shipmasters, consignees, or other persons having control over any rags, who shall wilfully neglect or refuse to obey, or carry out, or shall obstruct the execution of any of these regulations." Should an isolated case of small-pox by any chance occur in the country, it should be dealt with promptly by a system of notification and isolation carried out uniformly all over the country. And, if necessary, I would ensure the carrying out of that system by rendering medical men and householders liable to a penalty of 50*l.* for failing to notify immediately any case of small-pox, or any case that may reasonably be supposed to be small-pox. I would rely, in fact, upon a system of preventing small-pox similar to the system so successfully carried out in Australia. But though I would make the system of prevention as perfect as possible, I venture to think that the present system of notification and isolation, if uniformly carried out, is perfectly efficacious in stamping out small-pox, and I am encouraged in that belief by the following statement in the report of the Metropolitan Asylums Board for 1889, page 17: "These very satisfactory results confirm the view taken by the committee two years ago, to the effect that the rapid and systematic removal from crowded districts of infected persons, each of whom might have become a centre of contagion, is an important factor in stamping out small-pox from the metropolitan population. The notification of cases will also greatly facilitate the action of the managers in this direction." I maintain that at the present day the chance of any person being infected with small-pox is infinitesimally small when notification and isolation are conscientiously carried out. Indeed, the occurrence of such an outbreak of small-pox as at Sheffield amounts, in my opinion, to a public scandal. I would further point out to the Commission that even many medical practitioners have passed through their career in practice, and their hospital career, without ever having seen a case of small-pox, unless they have actually visited a small-pox hospital for that purpose. How small, then, are the chances of infection with small-pox! And in proportion as the possibilities of the importation of small-pox at our seaports are diminished, the chances of infection are still less. As regards vaccination, I would leave that question to the discretion of the individual, with liberty to take the advice of his medical adviser. Believing as I do that the stocks of vaccine lymph obtained from cow-pox, horse-pox, sheep-pox, cattle plague, and even attenuated variola-vaccine, produce, if any, a very transient effect, I should leave it to the individual to weigh on the one hand the advantages (if they exist) of "vaccination," and on the other the chances of infection with small-pox and the disadvantages and risks of "vaccination." A system of universal protective inoculation of healthy individuals as a means of warding off communicable diseases of man and animals has, in my opinion, had its day, but inoculation of individuals who are unfortunately the subjects of such diseases as rabies, tuberculosis, tetanus, is a new field of inquiry full of promise. In conclusion, I maintain that the State should protect the people from small-pox by a stamping-out system and by the encouragement of sanitary reforms, and not by any system of protective inoculation.

The witness withdrew.

Adjourned till Wednesday next at one o'clock.



## Fifty-first Day.

Wednesday, 10th December 1890.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
 Sir CHARLES DALRYMPLE, Bart., M.P.  
 Sir EDWIN HENRY GALSWORTHY.  
 Sir WILLIAM SAVORY, Bart.  
 Mr. CHARLES BRADLAUGH, M.P.  
 Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
 Professor MICHAEL FOSTER.  
 Mr. JONATHAN HUTCHINSON.  
 Mr. J. ALLANSON PICTON, M.P.  
 Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary*.

Mr. WILLIAM LOUIS BEURLE examined.

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12,421. (*Chairman*.) You live at 331, Victoria Park Road, South Hackney, do you not?—Yes.

12,422. And you were formerly a dealer in precious stones, but are now retired from business?—Yes.

12,423. You are a Guardian of the Hackney Union and have been an overseer?—That is so.

12,424. You are now a member of the vestry, and of the board of trustees and of the Hackney Board of Works?—Exactly.

12,425. You have devoted considerable attention to the questions connected with enforcing the vaccination laws, have you not?—I have.

12,426. I believe that you have attended, on many occasions, summonses taken out against parents for breach of the Vaccination Acts?—Yes.

12,427. Have you done so as a member of any local society?—I am vice-president of the Hackney League.

12,428. Of the Hackney Anti-Vaccination League?—Yes.

12,429. In what way have the parents come into communication with you?—Knowing that I sympathised with them I suppose that knowledge has been handed from one to the other.

12,430. How many summonses have you attended?—It is difficult to tell, I should say about 60 to 70; I have a bundle of the summonses here. Some of the summonses I returned. These that I have here are some that I have kept by me.

12,431. Over how many years would that number of 60 to 70 attendances extend?—I cannot exactly say. It was in 1881 that I attended in my own case; and afterwards I attended for others.

12,432. It is not necessary to be very precise as to the length of time over which they extend?—I defended myself in my own case in 1881; but I do not remember exactly when I commenced defending other poor people. I can find out if you wish.

12,433. I believe you desire to bring before the Commission the fact that the magistrates do not give effect to the provisions of the Vaccination Acts, which provide for exemption where there is a reasonable excuse?—That is so.

12,434. Would you call the attention of the Commission to the facts which lead you to make that representation?—Yes; I have been for some years in the habit of defending vaccination cases. I have attended some 60 summonses. My objections are, as I shall explain more in detail presently, with illustrations, (1) that section 29 of the Act of 1867 provides that the parent is not to be punished, if "he shall render a reasonable excuse for his neglect," yet this part of the section has been until recently habitually disregarded by magistrates, and parents have been fined who have actually lost a child through vaccination. (2.) Section 31 of the same Act allows the Justice, "if he see fit," to order a child to be vaccinated, but the parent is not to be fined for disobedience to the order, if "he can show some reasonable ground for his omission to

"carry the order into effect." This proviso is also constantly disregarded, and if parents have not had the child vaccinated no excuse is of any avail. (3.) Section 11 of the Act of 1871 allows the defendant in any proceedings under the Act of 1867, or that Act, to "appear by any member of his family, or any other other person authorised by him in this behalf."

12,435. You are now going to a different point, I think?—Yes.

12,436. You say excuses are not allowed. What is the description of excuse which you have heard rejected, as not being an excuse within the Act?—Such excuses, for example, as that they have had a child injured by vaccination, or that they have lost children by vaccination. Later on in my evidence I propose to state all these cases, if you will allow me to proceed.

12,437. If you are coming to that point, certainly. I only thought you were going to another head?—No. This section is constantly ignored by magistrates, especially in the country. I am constantly hearing of cases; and even at the Thames Police Court the clerk objected to my being heard, because I was neither the defendant nor a solicitor. (4.) The great difference in the costs and fines imposed, and the variations in the the practice. (5.) The non-prosecution of well-to-do persons who refuse to vaccinate their children.

In September 1880 my first child, Rosa, was born. After receiving several notices from the Vaccination Officer I was summoned to appear at Worship Street Police Court on 2nd December 1881. I pleaded before Mr. Bushby a conscientious objection to risking my child's health and life by subjecting her to the operation and quoted the case of a neighbour's child where the doctor had given a certificate, "Cause of death. Vaccination; rickets; certified by W. Sankey, L.R.C.P.," a certified copy of which I produced. Mr. Bushby refused even to look at it; and said he had only to carry out the law, and he fined me 20s. and 2s. costs, which I paid at once. I had at the commencement of the case tried to get out the facts connected with the illness and death referred to in the certificate, by cross-examining the Vaccination Officer who knew of it; but Mr. Bushby would not allow me to proceed. The next morning, 3rd December 1881, I was served with another notice. This was not followed by a summons. On the 27th December 1882 I was served with a notice to have my child Rosa vaccinated within 14 days. This was followed by a summons to appear at Worship Street Police Court on the 10th February 1883, when I again pleaded a conscientious objection, and a natural fear of the results; this I urged was a reasonable excuse as allowed by law. I also urged that I had already been fined for the same child, and appealed to Mr. Bushby to exercise his discretion and dismiss the case. He replied that he had no discretion except where the child in respect of which the parent was summoned was suffering from ill-health, and then he should require a medical certificate. In this he was clearly wrong, as sections 18 and 34 of the Act of 1867 make a medical certificate a sufficient defence. He added that he had nothing to do with the law except to administer it; and he therefore made



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an order for the child to be vaccinated within 14 days. The order was not served; I paid no costs; I was not asked for any, and I have not been troubled since for that child. On the 31st October 1883 my second child Louis was born. The usual notices for vaccination were followed by a summons under the 29th section to appear at Worship Street Police Court on the 11th June 1884. On that day I appeared with four other defendants before Mr. Flowers. One stated that he had lost a child through vaccination and could not conscientiously expose another to the same risk. Another pleaded "a reasonable excuse." He had known in his own family small-pox follow vaccination thrice repeated, and he knew of several cases of the transmission of disease by it. That was Mr. Bramwell Booth, a son of "General" Booth. A third defendant stated he had been vaccinated three times and afterwards had small-pox, and was very badly marked. I urged that I had a natural fear, and a reasonable excuse for not submitting my child to an operation the effect of which is to cause vaccinia, "an acute specific disease," so described by Mr. A. J. Pepper; besides which, there is the great risk of conveying other constitutional diseases by the same operation. Mr. Flowers said he was satisfied that the objections were conscientious, and would inflict a fine of 2s. 6d. After paying my first fine of 20s. in 1881, I resolved I would not pay any more fines but would accept imprisonment. About 12 months after a policeman called at my house with a warrant to detain. I told him there was nothing to seize except myself, and to do that he was welcome. He warned me that he should come for me in a day or two. I told him I was quite ready. He did not come, but I met him accidentally, when he told me that the Commissioner of Police had referred the case to the Home Secretary, who referred it to the President of the Local Government Board.

12,438. Pausing there for a moment, was it a fact that there were no distrainable goods there?—That was a fact. Some time after I saw in the local papers that the Local Government Board were of opinion that the matter should be allowed to drop. I heard no more of the affair. There were no prosecutions in the Hackney Union from the 11th June 1884, to my knowledge, until the 15th December 1887. The Hackney Guardians, by resolution dated 28th September 1887, decided to recommence by prosecuting about 14 defaulters. The first batch appeared at Worship Street Police Court on the 15th December 1887, before Mr. Curteis Bennet. The first defendant, before he had time to state his defence, was fined 20s. and 2s. costs. The next defendant was not allowed to finish the few words he had to say, but was fined the full penalty while he was speaking. I appeared for the next defendant, and was treated in the same manner, the full fine being inflicted. The next defendant was represented by a friend, who was served in a similar way, being fined 20s. and 2s. costs. The next batch were summoned to appear at Worship Street Police Court on the 22nd December 1887, six in number, myself being the seventh. The summonses were for orders under the 31st section. I was summoned for my third child, Adolf, born 8th July 1886. The informations had been laid before Mr. Hannay, who granted and signed the summonses; and as Mr. Hannay was not present, I at once raised the objection that Mr. Hannay could alone hear them. Mr. Bushby, after some discussion, said he thought the objection was a good one, and that he would adjourn the summonses. On the following Wednesday I did not attend. The first defendant was ordered by Mr. Hannay to have his child vaccinated within 21 days. On my case being called the magistrate asked the Vaccination Officer whether he had served the notice on Mr. Beurlé, the parent, as directed by section 31. He said no; he had left it at the house with the servant. Mr. Hannay said that would not do, and added that they must be very careful in carrying out the directions laid down by section 31, otherwise he and the Vaccination Officer would be liable to prosecution if he fined, distrained on, or imprisoned the defendant. The Vaccination Officer replied that he had never before served the notice on the defendants. Mr. Hannay said he had better do so in future, and that this summons must be withdrawn. The next had to be withdrawn for the same reason. In the remaining cases Mr. Hannay made orders to vaccinate within 21 days. None of these orders have been served on the defendants. In consequence of the revival of prosecutions a public meeting was held, and I was invited to stand for the Board of Guardians at the election in April 1888. In my address I stated that I was a determined opponent of the Vaccination Acts, &c., and I was duly elected. Another person (anti-

vaccinist), who had been prosecuted the week before I was, was also nominated as an anti-vaccinist pledged to vote against prosecutions. He tied with an old sitting member who had voted for prosecutions; and on a fresh election he beat him by a large majority. At the election in 1889 the chairman, who had been 32 years a Guardian and 17 years chairman, was defeated by an old Guardian who had previously voted for prosecutions, but now pledged himself to vote against them. The position which the chairman had taken, in voting for vaccination prosecutions, influenced many votes and secured his defeat. When sitting as Guardian a list of defaulters was reported by the Vaccination Officer. This was, on my motion, referred to a committee, and nothing was done until April 1889, when it was moved by Dr. Roland Smith, and carried unanimously, that no action be taken. In June 1889 a list of defaulters was submitted to the Board, and it was moved that they be prosecuted; to which an amendment was moved, and carried by 16 votes to 6, that no prosecutions take place until the Royal Commission now sitting issued their report. The Guardians in Bethnal Green, Mile End, and Shoreditch do not prosecute for non-vaccination.

I know several well-to-do persons who refuse to have their children vaccinated, and who have not been prosecuted. The following are from Hackney alone. Shall I read the names, my Lord?

12,439. You must use your own judgment about that. How do you know the facts?—From personal knowledge. They have told me themselves.

12,440. Do you think they would object to having their names mentioned?—I cannot say. Perhaps it would be better not to mention them.

12,441. (Mr. Bradlaugh.) How many are there?—16. At the very time that these gentlemen escaped, the Board of Guardians were prosecuting poor working people. I have attended about 60 summonses; I think rather more, I have rather understated the number. The magistrates have held that the "reasonable excuse" is unfitness for vaccination by reason of ill-health; to prove which they require a certificate from a medical man. In Fullagar's case, heard at the West Ham Police Court, on the 23rd August 1887, father and son suffered from eczema, and the father did not wish to risk giving this disease to others, or getting the diseases of others. This was the defence. Fullagar was fined 10s. and 7s. 6d. costs.

12,442. (Mr. Meadows White.) Who was the magistrate there?—That was Mr. Baggallay. Jesse Hott was summoned on the 26th October 1887. He pleaded in support of his objection that his brother had suffered injury from vaccination. He was fined 20s. and 7s. 6d. costs. A similar case was that of J. M. Stretton on the same day; and a like penalty was imposed. The first time to my knowledge that "a reasonable excuse" was admitted and the summons dismissed was in the case of A. S. Martin, of 30, Pollard Street, Bethnal Green, for whom I appeared before Mr. Bushby at Worship Street Police Court on the 29th November 1888. The defendant had a conscientious objection to the vaccination of his child, from painful experience of the ill effects of the practice on his three former children, all born healthy. These when vaccinated had shocking arms. They sickened, dwindled to shadows, and were always ailing. Two of them sank under bronchitis. The third child, born in August 1884, had an eruption all over her body, shortly after vaccination, which the doctor said was measles. She was ill for some time, became thin and delicate, and had never been thoroughly well since. This same child had measles about seven weeks ago; that is to say, she had measles for the second time within four years, if the eruption which followed her vaccination really was measles. The unvaccinated child (Edwin) in question was strong. He took measles from his sister, had it mildly, and was now well, plump, rosy, and healthy. I argued before the magistrate that the illness which had followed the vaccination of Martin's other children had excited in him a reasonable dread which constituted such a "reasonable excuse" as would justify a dismissal of the summons. Mr. Bushby said, it might be that a reasonable excuse was to be found in the fact that the inoculation of cow-pox had exceptionally severe effects in certain families; he would hear evidence to that effect. The aunt proved the statements I had made. The Vaccination Officer produced a certificate of the first child's death from bronchial pneumonia, lasting 16 days, which, he said, argued a strong child, who could not have been much weakened by vaccination, as asserted. Mr. Bushby said there was no doubt much to be said on both sides.



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There was, nevertheless, fair evidence so show that vaccination exercised a more than ordinarily prejudicial influence on Martin's family, which evidence he would accept as a reasonable excuse for refusing to allow the vaccination of the child in question. He would therefore dismiss the summons. At the meeting of the Bethnal Green Board of Guardians, on the 11th December 1888, the Vaccination Officer reported that Mr. Bushby had dismissed the summons against Martin on the ground of reasonable excuse, and asked the Board for leave to appeal; but this was refused. Mr. Curteis Bennet, at Worship Street Police Court, on the 15th December 1887, would not allow the defendants to defend themselves. He asked them whether their children were vaccinated; on their answering "No," he said "20s. and 2s. costs;" and although the defendants attempted to speak he would not hear them, and called for the next case. Mr. Horace Smith, at the North London Police Court on the 15th May 1888, in W. Law's case, (for whom I appeared) refused to hear a witness (Mrs. Newbold) as to the injury suffered by her child although it was acknowledged by the vaccinator (Dr. Cory) and Mr. Shirley Murphy to be due to vaccination. People tell me that they move their residences to avoid prosecution; and that in some cases they do not register the birth of their children. Some time ago an auxiliary postman who had been vaccinated in infancy, and had small-pox, was required to undergo revaccination or lose his situation. He was in great trouble about it, being an anti-vaccinist, but submitted. Poor people do not know how to defend themselves. They are convicted and fined in spite of the required formalities of the law not having been complied with. In many cases the summonses could be upset. The following cases (amongst others) I have upset. I appeared for Mr. E. G. Dornbusch at the Edmonton County Court on the 28th October 1886. He was summoned under section 31. The case was heard before I got there, and an order made to vaccinate "forthwith." On the 2nd December 1886 I appeared for him to a summons for disobedience to the above order. I submitted that the order was bad. Section 31 states that it must be made within a certain time, &c., &c.; and the order being bad on the face of it, I submitted that there could be no conviction. The result was that the summons was dismissed. On the 17th February 1887 I appeared for him to answer a summons under section 31 for an order to vaccinate. An order was then made "to cause the said child to be vaccinated on or before the 8th day of March 1887." On the 7th April 1887 I appeared for him to a summons for disobedience to an order made the 10th March 1887. The Vaccination Officer said that the order was made on the 12th February, which statement was incorrect; it was really made on the 17th February. I asked for the dismissal of the summons, their being no order of the 10th March in existence. The justices said the summons must be dismissed. I asked for costs. I was told I was neither Mr. Dornbusch nor a solicitor, and that I had no right to costs. On the 30th June 1887 I again appeared for Mr. Dornbusch to answer a summons for neglecting to vaccinate, taken out under the 29th section. On entering the court the assistant clerk came to me and said, "Are you going to get this summons dismissed?" I replied, "Yes." He said that they had made a mistake and summoned under the wrong section; would I be good enough to agree to the summons being withdrawn; he would pay any expenses I wished, otherwise it would injure his official prospects at the court. I replied that I did not wish to do that; I would agree to a withdrawal of the summons, and that I did not want him to pay my expenses. He said he had spoken to the Vaccination Officer, who was agreeable to that course being adopted. He then asked the Vaccination Officer why he did not leave Mr. Dornbusch alone. The Officer replied that it was not his fault, "it was the Guardians." We then went to the chief clerk who thanked me, and this ended the case. No more summonses have been issued since then. Thus, from a knowledge of the Vaccination Acts, five summonses and two orders were upset in the space of eight months.

12,443. (*Chairman.*) What importance do you attach to that story about Dornbusch? I do not quite follow it. There seems to have been a good deal of blundering?—The importance I attach to it is, that they do not fulfil the formalities that the law lays down. If I, or anyone else who appeared for him, had not been aware of the law he would, no doubt, have been convicted illegally, wrongfully. I attended the Thames Police Court on the 19th June 1887 to defend Mr. Langridge, of Mile End Road,

who was summoned under section 31. The summons was signed by Mr. Lushington, and Mr. Saunders was sitting in his stead. After the Vaccination Officer had stated his case I objected to Mr. Saunders hearing the case. Mr. Saunders asked whether I had the Act, and having referred to it said he must dismiss the summons. The clerk thereupon intimated that the Vaccination Officer could have another summons returnable that day week. A fresh summons was therefore served on Mr. Langridge, signed by Mr. Saunders. I again appeared for Mr. Langridge. After the Vaccination Officer had given his evidence I drew the attention of the magistrate to the fact that "an information" had been laid, which the 31st section required to be in writing, and I asked for its production. The Vaccination Officer was asked for it. He replied that he had not got one, and never knew that such a thing was wanted. Mr. Saunders said he must then dismiss the summons, and advised the Vaccination Officer to study the law, and proceed more carefully in future. I was in the Court at Worship Street on the 23rd December 1882, when Mr. Bushby, who had the previous day ordered Mr. Belstead to be turned out of the Court because he insisted on his right, under section 11 of the Act of 1871, to appear in defence of a Mr. Parrett, who was summoned for the non-vaccination of his child, apologised, and expressed sorrow for what had happened. The proceedings of the former day being illegal he said he should recall his decision, and the fine inflicted would not be enforced. Mr. Belstead expressed himself satisfied. I accompanied a friend who was summoned to Wandsworth Police Court on Friday, the 29th November 1889, under section 31. Instead of an order being made, according to law, a fine of 10s. and costs was inflicted, illegally. The gaoler induced my friend to go into his room, and there detained him. I informed my friend that he was being illegally detained; and appealed to the magistrate to order his liberation, when he replied that my friend could bring an action for false imprisonment against the gaoler. However, he was soon set free, and he wrote to the Court complaining of the manner in which he had been treated. A policeman had, in the interval, called for the fine and threatened distraint. My friend told me it was acknowledged that the proceedings were irregular, and no further action was taken on that summons. These illegal proceedings, with a poor person, unversed in the law, would have passed unchallenged. No costs are granted, to my knowledge, when the proceedings are upset or the summons dismissed. If the defendant is represented by a friend versed in the Vaccination Acts, and he gets the summons dismissed, and asks for costs, he is told that he is not the defendant, neither is he a solicitor, therefore costs will not be allowed. The probability is that if the defendant appeared in person he would be convicted, simply through not knowing the Vaccination Acts, and owing to his inability to draw attention to their violation. Another injustice is the enormous difference in the costs outside and inside the metropolis. The costs in West Ham Police Court are from 7s. 6d. to 9s. for one summons. At Edmonton they vary; sometimes they are as much as 12s., sometimes 14s. The same in country districts: a poor agricultural labourer has to pay six or seven times the amount of costs paid by an artisan in the metropolis, where the cost is 2s. Again, in some districts the Vaccination Officer does not proceed under the 29th section for children under the age of 15 months, but, as at West Ham, proceeds under the 31st section, which means two summonses, two attendances, and an order, amounting in some cases to 15s., exclusive of fines. This in the case of poor persons (and anti-vaccinists are mostly poor persons) is a great hardship. During the time that I have been an anti-vaccinist I have constantly seen poor parents treated in this manner; 200 is within the mark. I am every week hearing of cases of opposition. Notices are sent out undated, or dated in pencil. A medical man, a friend of mine, told me recently that he had under his treatment four cases of erysipelas, in each of which he believed the disease was communicated by vaccination; in these cases he had himself vaccinated the children with calf lymph. Another medical man told me that he in-vaccinated measles from a vaccinifer, which vaccinifer developed measles four days after the vaccine virus was used. The measles and vaccination ran together. The vaccine pustules were normal. A case of erysipelas due to vaccination with calf lymph nearly proving fatal, reported to me by Mr. Roland Smith, M.R.C.S., was that of Grace Maffia, of 26, Quasted Buildings, Brett Road, Hackney, who was born on the 4th August 1890, and was vaccinated in three



places on Wednesday, 22nd October 1890, with calf lymph. She was examined on the 29th; the vesicles were then normal; and the case apparently ran a normal course as late as the 12th November. On the 15th Mr. Roland Smith was called to see the baby. From this day he saw the child every day, sometimes twice a day, until he considered it convalescent, on the 28th. On the 15th erysipelas began with redness, swelling, marked induration round the wounds, which were rather deep and sloughy. The temperature first was 103; varied during the week from 103 to 105; the redness and swelling extended down the right (vaccinated) arm to the hand and fingers. That began to get better. The erysipelas travelled across the chest in a band about four inches wide to the opposite arm, hand, and fingers. The whole lasted twelve days during seven of which the child was in great danger; that is, from the 17th to the 25th. Four other cases vaccinated from the same supply of calf lymph all ran a somewhat irregular course, with more or less erysipelatous inflammation. One of them had an abscess under the arm in the axillary gland from which—I do not remember exactly, but I think the doctor said, either a pint or half a pint—say, half a pint of blood and matter was discharged.

12,444. Who gave you this information?—The doctor himself.

12,445. Dr. Roland Smith?—Yes, Dr. Roland Smith, and another medical man has given me facts respecting a case of in-vaccinated measles.

12,446. (*Professor Michael Foster.*) Do you know the source of that calf lymph in the case you are quoting?—Renner's. I have here the certificate of death which I produced to Mr. Bushby in my own case. This is a certified copy.

12,447. (*Chairman.*) Which case does this certificate relate to?—That is the certificate used in my own case when I was summoned. I produced that certificate to the magistrate.

12,448. I mean of whose death is it the certificate?—It relates to a death in the family of my next-door neighbour, at least he was my next-door neighbour. A child of his died, and that is a certified copy of the death.

12,449. (*Mr. Meadows White.*) Are you aware whether any case has been taken up to the superior courts from the police magistrates?—No, I am not.

12,450. You do not know that there has been any such case?—No, I do not.

12,451. Has any attempt been made to obtain the decision of a superior court by asking for a case?—No; the parties have not applied. The expense has been so great that they could not afford it.

12,452. Although the opinions of the people summoned and fined are sometimes well backed up as regards the expense, you find that a case has never been applied for?—Not during my experience.

12,453. I have not found such a case myself; I was only anxious to know whether you had?—No, I have not found any such case. I have written to the Home Secretary once or twice.

12,454. (*Chairman.*) In the case to which you refer, when you say that the doctor certified as the cause of death "vaccination, rickets," I observe that the age of the child was two years; did you know at what age the child had been vaccinated?—I did not. I believe it was not very long after the vaccination that it had a serious development.

12,455. Is "W. Sankey, L.R.C.P.," who certifies, a medical man residing in Hackney?—Yes.

12,456. He is still there?—Yes, he is still there.

12,457. (*Dr. Collins.*) I understood you to say that cases had come to your knowledge in which the statement in court that a previous child had died from the effects of vaccination had not been accepted as a "reasonable excuse"?—That is so.

12,458. Did you tell us the names or could you give us the number of any cases in which that has occurred?—Yes. There is the case of Mr. Bramwell Booth, son of "General" Booth, and there was another case.

12,459. The name of the magistrate is what I want?—That was before the late Mr. Flowers.

12,460. Can you give us the names of any other magistrates?—There was a similar case before Mr. Bushby.

12,461. (*Mr. Meadows White.*) The magistrates, I understood you to state, would not allow any excuse?—Not until recently. Previously they would not. It is only recently that the case of Martin which I cited occurred. Mr. Baggallay is the name of another of the magistrates before whom some of the cases came.

12,462. (*Dr. Collins.*) I understood you to refer to certain persons, whose names you were prepared to give, who were in fairly easy circumstances who had not been prosecuted for not having their children vaccinated; that is so, is it not?—Yes, that is so.

12,463. What in your opinion, as a Guardian, and therefore acquainted with the prosecutions under the Vaccination Acts, would be the result if the law should be altered so that one penalty only were imposed and no repeated penalties inflicted? What would be the effect of that in such a neighbourhood as yours, where you have both poor and fairly well-to-do people; in what way would it operate?—I think the result would be that many would be prepared to stand one prosecution. It is the feeling that they are exposed to more than one penalty that operates in many cases.

12,464. (*Chairman.*) You mean, that is as to the feeling of the matter; but I think what Dr. Collins meant was this: whether the people who have a conscientious objection now give in by reason of the repeated fines. I think that is rather the point that is put to you?—Is that so?

12,465. (*Dr. Collins.*) I should be glad to have an answer to that question?—Well, I can hardly say. I can hardly give an opinion as to whether they would give in. It depends very much upon how they are pressed. I think that a truly conscientious objector would stand out at any risk.

12,466. Are there persons summoned and convicted under the Acts to whom a 1*l.* penalty might be a serious matter?—Oh, yes.

12,467. And upon whom distress might be levied in consequence of inability to pay?—Yes; and distress has been levied. I have got cases here, the cases of H. Fuller and F. Golding; distrains for the sale of goods. In the case of F. Golding his goods were taken under the first conviction, and then on a second conviction there were no more goods to be taken, and he was sent for three weeks to Holloway Gaol.

12,468. I understood you to say that in your neighbourhood, especially lately, the Acts had not been carried out with any great severity; have there been any other instances in which imprisonment has resulted from conviction under the Acts?—Not within my knowledge. There have not been any other such cases to my knowledge.

12,469. (*Mr. Picton.*) Do you know how that man that you just now referred to was treated in prison? Was he treated as a common criminal or as a first-class misdemeanant?—He was *not* treated as a first-class misdemeanant. He complained very much of his suffering.

12,470. (*Mr. Meadows White.*) Did he complain to you?—Yes, he complained to me; he came to me.

12,471. (*Mr. Bradlaugh.*) You told my Lord that you had attended the courts on behalf of a great many persons who were summoned; you have attended gratuitously, I believe, always?—Yes, certainly.

12,472. Did you do so in consequence of your views on vaccination?—Yes, that is so.

12,473. And shall I be right in assuming that you personally incurred considerable expenses in endeavouring to defend some of those people?—Yes, that is so.

12,474. To the poorer people the fact of adjournments, if they often took place, of summonses would be an additional oppression, would it not?—It would.

12,475. Do adjournments often taken place, for one reason or another?—Yes. I have had several cases where adjournments have taken place. In one case that I have in my mind there were six adjournments.

12,476. (*Mr. Meadows White.*) Was that by reason of the non-attendance of the parties, or for what reason?—I appeared for the parties. It was on account of Mr. Phillips being ill.

12,477. (*Mr. Bradlaugh.*) Who was Mr. Phillips?—Mr. Phillips was the magistrate at the West Ham Police Court. He was ill, and his deputy, Mr. Culpepper, attended, but before Mr. Culpepper could sit to adjudge.

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cate in this particular case Mr. Phillips had died, therefore there was some difficulty.

12,478. That is a very exceptional case, then?—Yes.

12,479. I think you mentioned either one or two Boards of Guardians, I did not quite catch which, who had determined not to prosecute during the sittings of this Commission; do you know of more than two?—Not personally; but there are many in the country in a similar position. It is a matter of common knowledge that there are a great many, I think; up to a certain period there were something like (about) 50. I had commenced making a list of them at one time.

12,480. Are you able to say, apart from your own views on the matter, whether there is a strong (or other) feeling against compulsory vaccination?—I am able to say that there is a very strong feeling indeed amongst the people, that is to say, amongst the masses.

12,481. "The masses" is rather general. Could you say that that strong feeling exists amongst the labouring classes?—Yes, amongst the labouring classes.

12,482. What district would you be specially speaking for, of your own knowledge?—I should be speaking of Hackney, Bethnal Green, and Shoreditch.

12,483. Are those three densely populated districts?—Those are three densely populated districts. The feeling is very, very strong.

12,484. Do you happen to know, apart from the resolved action of Boards of Guardians, that there is extreme uncertainty in the action of the Vaccination Officers?—That is so.

12,485. Sometimes passing cases entirely?—Yes.

12,486. And sometimes repeatedly prosecuting in particular cases?—Yes.

12,487. (*Dr. Bristowe.*) I understood you to quote one case in which it was asserted that measles were imparted by vaccination?—That is so.

12,488. And the measles came out four days after the vaccination had taken place?—That is so.

12,489. Does that mean that the eruption showed itself four days after the vaccination?—I will just refer to my notes before I answer that question. The vacciner developed measles four days after the vaccine virus was taken.

12,490. Then the measles was not imparted by the vaccination?—The vaccine was used.

12,491. (*Chairman.*) Did the vaccinated child get measles from the effect of the vaccine lymph?—Yes.

12,492. When did the measles appear in the vaccinated child?—I have no further information, but I have written to that gentleman, and he has kindly given me permission to use his name.

12,493. Is that the father of the child that you refer to?—No, the medical man who told me the circumstances. I do not know anything about this case except what the medical man informed me.

12,494. What is the name of the medical man?—Mr. Millice Culpin, L.R.C.P., and L.R.C.S., Walthamstow.

12,495. (*Dr. Bristowe.*) Was measles prevailing at the time?—I do not know.

12,496. (*Sir Edwin Galsworthy.*) You said that there was a strong feeling against compulsory vaccination from your own knowledge. How do you derive that knowledge?—I took part in a vaccination census and went from house to house.

12,497. In what district?—In the Homerton Ward, Hackney.

12,498. Are you a Guardian yourself?—I am.

12,499. Of what Board of Guardians?—The South Ward of the Hackney Union.

12,500. (*Mr. Meadows White.*) There is one question I wish to ask upon a point on which I did not quite follow your answer. Did you say your impression was that a great many more people would resist vaccination if there was only one fine possible?—I think so.

12,501. That would be so to a considerable extent, you think?—Yes.

12,502. Therefore repeated fines has the effect—whether a good effect or not—of inducing people to submit their children to vaccination?—Some classes of people; not determined people; not conscientious objectors.

12,503. (*Chairman.*) Supposing that by law a person who had a conscientious objection, on properly representing—or indicating—the fact, were excused, do you think that that would diminish the anti-vaccination agitation?—I certainly think it would.

12,504. I suppose, now, there is a powerful crusade against vaccination by reason of the feeling existing on the part of those who are thus forced into vaccination?—That is so.

12,505. (*Mr. Bradlaugh.*) In that case you mentioned of Golding's, there was great excitement, and a number of meetings were held in connexion with it, I think, were there not?—There were.

12,506. (*Chairman.*) Is it the fact, in the cases where, in your experience, the Guardians have determined not to prosecute, that so long as that determination has lasted there has been no prosecution at all?—There have been no prosecutions in those cases.

12,507. I mean, the Vaccination Officer, himself, did not prosecute?—No; but he still issues the threatening notice all the same; therefore, these poor people, who are not conversant with that which takes place at the Board of Guardians, are still under the impression, vaguely, that there is something serious likely to follow.

12,508. However, that notice is not followed by prosecution. The Vaccination Officer does not himself prosecute where the Guardians do not?—No, he does not.

12,509. Do you know whether the Local Government Board has intervened, or whether it intervenes at all, in these cases?—They have not intervened in Hackney.

12,510. I think you told us that on the first occasion the non-prosecution determination lasted some years, from 1884 to 1887, I think you told us, that would be three years?—I believe that is correct. There was no prosecution in the Hackney Union, to my knowledge, from the 11th June 1884 (that was my case where I was fined half-a-crown) until the 15th December 1887.

12,511. Then it was resumed again in 1888, was it not?—In 1887 they re-commenced, and they continued from that time.

12,512. Then they continued from 1887 to 1889, did they not?—No; from 1887 until I came on the Board.

12,513. When was that?—That was April 1888.

12,514. For a year then, about?—No, not a year; about four months.

12,515. Can you tell us anything about the vaccinations in Hackney during the time previous to 1884, from 1884 to 1887, and again when prosecutions were resumed at a subsequent time; can you tell us whether the non-prosecution had a great effect upon the number of vaccinations?—I cannot tell you with any degree of certainty; but I think it is very probable that the defaulters are more numerous now than they were before.

12,516. However, you have no statistics upon the point; you have not gone into that at all?—No, I have not gone into that.

12,517. (*Dr. Collins.*) I do not know whether you gave us the figures as the result of your census inquiry?—No; that, I think, comes under another head. I have not touched that at all.

12,518. (*Mr. Meadows White.*) You do find, do you not, that the prosecutions have the effect of stirring up people although they have a conscientious objection to vaccination?—No. I do not think it would do so; negligent people will not stand out against anything; you can push them anywhere. It is only when you come across the sturdy, stiff-backed men that you find them stand out. In their case the prosecutions only tend to accentuate the conflict.

12,519. I quite understand that; and it is, or may be, very much to the credit of the people; at the same time these prosecutions have the effect of preventing the neglect of vaccination, have they not?—I think that the notices are quite sufficient. The notice is really very strong indeed.

12,520. (*Mr. Bradlaugh.*) With reference to the question put to you by my Lord about the action of the Local Government Board against Guardians, and particularly the action of the Local Government Board against the Keighley Guardians which involved their being committed to York Castle; do you happen to know that there was then a strong increase of anti-



vaccination feeling for miles around that district?—That, I believe, is the fact.

12,521. (*Mr. Picton.*) Have you known cases in which there have been repeated prosecutions of the same kind, and where severe proceedings against a man have called attention to the subject in the neighbourhood of his home and have occasioned inquiry?—We have never had “repeated” cases. I think my own case is exceptional. They prosecuted me twice for the same failure to comply with the notice, but our Guardians are very liberal, large-hearted men; and they attacked me a second time, I think, simply because I was in a better position than many of the others. As a matter of fact, they are very much against a second prosecution; in fact, I do not know of any case in Hackney in which they prosecuted a second time. They honoured me by a second prosecution for the same child; but that is quite exceptional with them.

12,522. Was any effect produced in the neighbourhood by the second prosecution: was attention directed to the matter?—It simply got bruited about that I was very much opposed to the vaccination laws, and that anyone who wanted any advice, or help, simply had to apply to me.

12,523. Then it was made the means of stimulating inquiry on the subject?—Yes.

12,524. (*Professor Michael Foster.*) I think you said that what you urged as a reasonable excuse was not accepted by the magistrate as a reasonable excuse?—That is so.

12,525. Can you state, briefly, what you consider to be a reasonable excuse?—As the law stands, the belief of having lost a child in the family I hold should certainly constitute a reasonable excuse.

12,526. In some of the cases you have referred to the parents had not lost a child; they only knew of damage to the children of others?—That would be one element.

12,527. Would it be a reasonable excuse, do you think, for them to have heard of mischief, or supposed mischief, from vaccination?—I think that if the parents were able to allege that they had known of cases where mischief had occurred through vaccination that would be a reasonable excuse.

12,528. Do you mean known personally?—Yes, known personally.

12,529. And investigated them themselves?—Yes, and investigated them themselves.

12,530. With power to form a judgment on the matter?—I cannot say anything about the “power.” Perhaps I might not have “power to form a judgment,” still I should consider that that would be a reasonable excuse in my case if I had formed an honest judgment.

12,531. You mean, as I understand, any case in which a person believed he had seen with his own eyes someone who had suffered from vaccination?—Yes.

12,532. Perfectly independently of that person’s ability to form an opinion on the subject, you think that that would be a reasonable excuse?—Yes, I think so; in fact, the 31st section of the Act says that there is no compulsion on the part of the magistrate; he may, “if he see fit.”

12,533. I only wanted to know what your view of a “reasonable” excuse was?—That is my view.

12,534. (*Mr. Picton.*) Within your own district, or a district of which you have knowledge, has there been any case of death from vaccination?—I am sorry to say there have been several, certainly several that have been alleged to be due to vaccination.

12,535. And cases in which there have been inquests held?—Yes.

12,536. Has there been a case in which a coroner’s jury has given a verdict that the death was caused by vaccination?—Yes.

12,537. More than one?—Only one inquest that I remember in Hackney.

12,538. Can you tell us what the verdict was in that case?—The verdict was that the death arose from vaccination.

12,539. How did vaccination cause the death?—I think it was convulsions, convulsions arising from vaccination.

12,540. (*Chairman.*) Can you tell us about when that was?—That was in 1884. E. M. Sharp, I think, was the name. I cannot give you the exact date.

12,541. Can you tell us before what coroner it occurred?—Before the deputy coroner, Mr. Collier.

12,542. (*Dr. Collins.*) What was the age of the child?—I am not prepared to give you the details of that case. I cannot say what the age of the child was; it was very young.

12,543. (*Mr. Picton.*) Did the Local Government Board take any proceedings in consequence of that verdict?—Not that I know of.

12,544. Did they send down anyone to inquire into the case?—Not that I know of.

12,545. (*Professor Michael Foster.*) You have said that in Hackney the labouring classes, you thought, were very much opposed to vaccination?—That is my experience.

12,546. Do you think they are more opposed to it than the class which is sometimes spoken of as “small tradesmen”?—The small tradesmen are very much of the same opinion.

12,547. You would not distinguish between the two classes in that respect?—No, I should hardly distinguish between them.

Adjourned till Wednesday, the 21st of January 1891, at 1 o’clock.

## Fifty-second Day.

Wednesday, 21st January 1891.

PRESENT:

SIR JAMES PAGET, BART., IN THE CHAIR.

Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. BRET INCE, *Secretary.*

Mr. GEORGE CORDWENT, M.D., F.R.C.S., examined.

12,548. (*Chairman.*) You are deputy coroner for West Somerset?—I am.

12,549. And have you been in practice for nearly 50 years?—Just 50 years this year.

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12,550. You have held the appointment, I believe, of Public Vaccinator?—I was Public Vaccinator for 20 years in the Pitminster district of the Taunton Union, and for seven years of that district conjoined with the

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G. Cordwent,  
M.D.  
21 Jan. 1891.



Mr.  
G. Cordwell,  
M.D.

21 Jan. 1891.

West Monckton district, the two districts together during seven years, and one district for 20 years and six months, besides which I had a very large general practice.

12,551. From which you retired, at what date?—I partially retired from Taunton about 13 years since. I have had a consulting practice since that time. I now reside at Milverton.

12,552. Was your chief experience of small-pox in the epidemics in Taunton in 1848, 1858, and 1871-72?—Certainly I had a good deal of experience of it in those periods and occasionally of cases at other times, but upon rare occasions.

12,553. Is it the case that you have found the result of vaccination quite unsatisfactory?—Certainly. I have seen a great number of cases, probably in the course of my time 300 cases at least, of small-pox occurring after vaccination, and several cases after re-vaccination; I cannot tell how many, probably two or three dozen, or more than that.

12,554. In what number of years would those cases have occurred?—I began practising in 1841 at Hatch Beauchamp and then I passed on to Taunton.

12,555. That number of cases which you have seen of small-pox after vaccination would be spread over some 40 years?—Yes, small-pox I have observed has recurred, I will not say in exact cycles of time, but there has been an epidemic after an interval of 9 or 10 years; that I think has been about the period in which epidemics have occurred.

12,556. What is your opinion concerning the occurrence of small-pox after vaccination?—I have seen a great number of cases occurring after vaccination, and some, a lesser number but a considerable number still, after re-vaccination.

12,557. Have you seen any occurrence of second attacks of small-pox?—I cannot say that I have. I have not seen a single case of small-pox recurring. I have seen cases which have approached the character of small-pox, little vesicular cases, but certainly not preceded by that expressive fever which precedes small-pox; the vesicles come out almost without fever, and are of a different character from the vesicle of small-pox. Small-pox has a vesicle which is almost unmistakeable.

12,558. What do you call the disease which has occurred in that manner?—It is a vesicular disease; it is sometimes called chicken-pox and water-pox.

12,559. You think it is not a modified small-pox?—I do not see how it could be modified. It is not preceded by any of the symptoms which precede small-pox, but it approaches in type those vesicular diseases which are seen by every medical man, and not at times when small-pox is epidemic. Every medical man must have seen a number of those cases of vesicular diseases occurring in children.

12,560. (*Professor Michael Foster.*) You are speaking not of cases which have occurred where the patient had previously had small-pox, are you?—I am speaking of cases where it occurred casually as it were.

12,561. And not confined to those who had had small-pox?—No, not confined to those who had had small-pox, but occurring amongst a multitude of cases.

12,562. And what you are saying now is that you have never seen a real case of small-pox recurring in a patient who has had small-pox, but that you have seen people suffering from a vesicular disease which you might call chicken-pox, which might also occur amongst those who had had small-pox?—Yes.

12,563. (*Chairman.*) Were those cases at all more numerous during the epidemic of small-pox?—I do not know; I think I have seen such cases as that perhaps before small-pox, just as one sometimes sees cases of diarrhoea before malignant cholera. I cannot speak with certainty; I have the impression that these vesicular diseases were perhaps a little more prevalent at that time, but still they have occurred frequently when small-pox has not been epidemic, and when there has been no case of small-pox for years.

12,564. I believe that you regard the preventive power of vaccine lymph, if there be any, as being limited to the cases in which it sets up malaise?—Certainly; that it does set up malaise, I have not the slightest doubt. In view of the very fact that the system does not accept two diseases at the same time small-pox does not occur. When it does not occur after vaccination I attribute it to that, because I certainly have seen disturbance of the system after vaccination;

but the vesicle, and a vesicle perfectly typical too, is not necessarily followed by the vaccine disturbance. I have seen hundreds of cases, and I may say in the majority of cases of vaccination the vesicle which came out perfectly typical is not followed by any irritative fever. The irritative fever has appeared to me to be indicative of the virus being accepted into the system. It frequently is not accepted into the system, and therefore the thing is impotent, it does not express itself one way or the other.

12,565. You think the cases in which this general disturbance is not produced are not protected?—That is so; there is no disturbance set up in the system, and the system is then as it was before.

12,566. Quite as susceptible of small-pox?—Undoubtedly quite as susceptible of small-pox, (that is the system) as though vaccination had not been performed.

12,567. In the cases of small-pox after vaccination which you have observed did you find, or were you able to learn, whether any considerable proportion of them did not have a general disturbance of the system after vaccination?—I could not say. The medical man receives in fact a vaccination book in which he reports, every fortnight or so to the Boards of Guardians the cases which he has vaccinated returning them as "successful" or "unsuccessful," as the case may be. I may say that in vaccination not one case in 300 will fail of having the typical vesicle, and therefore it is returned to the Board of Guardians as being "successful." It is successful so far as it is obvious to the sight, that is to say there is the typical vesicle. It is so returned without reference, in fact, to the vaccine fever which, to my mind, is typical of the virus being accepted into the system. Still it was accepted by the Boards of Guardians to the extent of payment being made for every case exhibiting the typical vesicle.

12,568. Have you been able to obtain any distinct facts which would show that in the cases where there was no vaccine fever, as you have named it, there was far greater susceptibility to the small-pox than in others?—I did not look to that. I was at the time in very large general practice, and having two assistants with me we were all very busy together, and I had not time enough for pathology to hunt that out. I know that vaccination paid remarkably well, but whether it was followed by fever or not I could not say. All I know is that after typical vaccination was accepted hundreds of cases of small-pox have been seen by me, I should say at least 300 cases.

12,569. What is it that leads you to consider that the fever which is excited in some cases is that which confers any degree of protection?—I do not say that it confers any protection, but I say that the inoculation of any virus into the system would of course promote some disturbance of that system, otherwise it would be perfectly negative. When I was a boy inoculation, which was then practised, would have that disturbance set up after it; and of course if rabies were communicated, that would set up a disturbance, although that is a very obscure disease and very rare; there may be lots of bites without rabies following. But take for instance snake poisoning, the snake poison being inoculated, would result in the disturbance of the system.

12,570. Would that give any protection against subsequent snake bites?—I cannot say that. I only say that the virus being inoculated into the system would pronounce itself, and therefore the vaccine lymph being passed into the system, may produce a vesicle, and does produce a vesicle, without being followed by that irritative fever which, to my mind, declares the fact of the system having accepted it.

12,571. (*Sir William Savory.*) Are you speaking from memory or from any notes of cases or records which you possess?—I am speaking from memory, except that I have just a note or two which certainly will be interesting to some and I have no doubt to all; and I will just read them, if you will allow me. The first is a note of a case which occurred nearly opposite my residence in Taunton, and therefore was known to me at the time. This is what the lady stated to me when I was in Taunton six weeks ago, and I made a note of it because I thought it probable that I might be called before this Commission; but of course at the time when these cases of vaccination were going on I never expected that there would be any special inquiry about them. This is a case which occurred to me within my own knowledge, and which I have revived again by some notes: "Mrs. Charles Parsons, widow of Mr. Charles Parsons,



"formerly landlord of the Albion Inn, East Reach, Taunton, states (what was previously known to me) that 'in the year 1869, in the September of that year, 'I was expecting confinement for my fourth child. A 'tramp woman brought an infant with her to our 'inn, the child was much disfigured by recent small-pox. Its face was covered with scabbing sores of 'the small-pox. She said the child had been vaccinated. I have no further evidence of that than her 'word. I was much shocked by the sight of the 'child, it made a great impression on my mind. A 'few days after I was confined of a still-born child, a 'son at full period, the child had no mark of small-pox on it. On the Saturday following the Monday 'on which the child having small-pox was brought to 'me, small pox came out over me. I had given birth 'to a still-born child two days previously. I had 'small-pox badly; Dr. Kelly (of Taunton) attended 'me. The small-pox was confluent. I had been 'vaccinated.' Now I knew the woman had been vaccinated, but she had been vaccinated in youth, and when she was making these statements to me I examined her arm, and there were typical marks of vaccination. Mrs. Parsons proceeded to say, "I had three living children, that is to say, three besides the one just then 'still-born; only one of those three children had been 'vaccinated; neither took the small-pox, although 'they remained in the house with me and occasionally 'came into my bedroom. Two nurses attended on me, 'one of them regularly, by name Mrs. Edwards, of 'King Street, Taunton, the other occasionally, Mrs. 'Joseph Goodman," who lives near and who is a furniture-broker's wife. "The washing was done at home, 'and the business of the inn was carried on as usual. 'We had a large custom, especially for beer, partly for 'consumption at the inn, and partly for family supply; 'no one took the disease." Now I know that it is perfectly true because it made a great impression on my mind at the time although the patient was not mine. "There was no case of small-pox that I heard of during 'the next two years. Then about 1871 or 1872 small-pox 'became prevalent at Taunton," it was "epidemic." "The first case was in String Lane, at the bottom of 'East Reach, quite a third of a mile distant from the 'inn in which we lived." This statement was formally made by her, but the facts were within my own knowledge.

12,572. I am afraid you have rather misapprehended my question. That illustrates the fact that occasionally small-pox occurs after vaccination, but my question had rather reference to the proportion of cases in which small-pox occurs after vaccination. You mentioned about 300 cases of small-pox after vaccination in your practice of about 50 years?—I will not say 300; it was probably more.

12,573. How did you arrive at that impression?—A vast number of cases occurred in my practice. A great many occurred in the Pitminster district and in the West Monckton district.

12,574. Have you any notes of those cases?—I have no notes of those cases. A case occurred when an outbreak of small-pox took place in Taunton, in 1871. I was very much interested in the disease then from some cases I had seen of the peculiar behaviour of small-pox in reference to vaccination. Although I had not then a district, by permission of the medical officer I was allowed to examine some cases which occurred. I really cannot tell you the facts, because I have lost the notes in changing my residence from Taunton to Milverton; but I remember between 30 and 40 cases of small-pox in children after vaccination, they having vaccination marks at the time.

12,575. How many cases would those have amounted to?—I cannot say how many, but over 30, probably 40. I took notes at the time, and when the Medical Association met at Birmingham, which I think was in 1872, I read a paper there upon this very same subject; I have looked over and over again for my paper, and I cannot find it. I think I must have lost it in my change of residence.

12,576. In order to arrive at the proportion of cases of small-pox after vaccination which you have seen, can you give the Commission any idea of the number of cases of small-pox altogether that you have seen in your practice?—Do you mean in the three epidemics I have observed?

12,577. Yes, altogether?—I should say, perhaps 500 or 600.

12,578. So that more than half those cases would have been previously vaccinated?—I should say so, decidedly.

12,579. It would come out according to your statement that more than half the cases of small-pox that you have seen had been previously vaccinated?—I believe so, much more than half.

12,580. (*Chairman.*) May I ask what proportion of the persons in Taunton and the district you have attended have been vaccinated, and what not vaccinated?—They had been nearly all vaccinated; vaccinated in their youth.

12,581. Therefore, your 300 or 400 cases who had small-pox after vaccination would be a very small proportion of the total number?—Certainly. I do not think I have seen any suffering from small-pox who were unvaccinated, except a gentleman about the year 1841; he had been living a very erratic life, and he came to his home suffering from malaise, discomfort, and pain in the back, and pain in the head; he had the premonitory symptoms, in fact, of an eruptive fever. An eruptive fever did come out, it was small-pox and it became confluent. There was no small-pox in the neighbourhood and no small-pox did follow, although he was attended by nurses and there were unvaccinated children in the house, because vaccination was not then so much insisted upon; still the small-pox did not become epidemic and did not spread, although there was no cordon drawn around, and there was no objection made to externs communicating.

12,582. I take it that you took no note at the time of your observations as to those who were vaccinated and those who were unvaccinated?—I did not.

12,583. So it was a general impression?—Yes, it was a general impression. If it is not troubling the Commission too much, and is thought suitable, I will just read a note of a remarkable case. A woman states: "I am the 'wife of Mr. John Pote, a tailor, he is from home now 'but would like to have seen you."—She says that because formerly, a good many years ago, I attended the family, and they like to see their old doctor, I daresay—"I am his third wife, his second wife died of small-pox 'in 1858; she had been vaccinated. The small-pox 'was confluent. Dr. Cordwell attended her. She was 'six months advanced in pregnancy; she did not mis-'carry. At that time William Woodbury and his wife 'lived near. I was intimate with both the Potes and 'the Newburys; both the Newburys had been vacci-'nated. Mr. Newbury afterwards showed me his right 'arm, there were vaccination marks on it."—I think there were three; but I cannot say whether there were two or three.—"Mrs. Woodbury told me she had been 'vaccinated; I did not see her arm." Then this is a note of my own. "In the epidemic of small-pox in '1858, the disease was especially prevalent on the 'south side of East Reach, Taunton." I live in one part of East Reach, upon the east side of it, but I knew this was going on in the street. "Vaccination was then 'actively proceeded with." Immediately small-pox breaks out people rush to the medical men to be vaccinated for a second time, and even a third time some of them. "Among the many vaccinated was a woman who 'lived near Mrs. Pote whom I was then attending, 'who had a well developed vaccine vesicle on her right 'arm" (I remember seeing it as distinctly as possible) "at 'the same time that small-pox vesicles were proceeding, 'neither modified the other." This woman was not a patient of mine, but my attention was directed to her. I forget the name of the woman, if I ever knew it, but the case was remarked by her neighbours, who pointed it out to me.

12,584. (*Mr. Hutchinson.*) Did she recover?—Yes, she recovered.

12,585. Was that a mild attack or a severe attack?—It was a severe attack.

12,586. (*Chairman.*) What was the interval between the vaccination and the occurrence of small-pox?—It seems as though the small-pox must have been in embryo at the time the vaccination occurred; and that she being vaccinated before the small-pox came out, the vaccine vesicle and the small-pox occurred at the same time.

12,587. You are aware perhaps that that is usually the case?—I am not aware of that. I have only seen one case of vaccination and small-pox at the same time.

12,588. (*Dr. Bristowe.*) What is your inference then in quoting this case?—I am only saying that the one was not, at that stage at least, an antidote to the other.

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12,589. I do not quite see the point of it?—I only stated that they did proceed together.

12,590. That, as Sir James Paget has said, is well known to occur?—I daresay it might occur, but I have only seen that one case of it.

12,591. (*Professor Michael Foster.*) Are you not aware that the question has been very fully investigated as to the exact dates at which you may suppose that any protection begins?—I have not seen any protection at all.

12,592. Let us say “supposed protection”; are you not aware that a very large number of observers have made a very large number of observations as to the relative dates of vaccination and the appearance of small-pox; do you think it is singular that there should be an eruption of vaccinia and small-pox at the same time in the same body; are you aware that that was a matter of very common observation?—I was not aware of that. I know it is contended that there are cases of that kind, but I have not seen any others beyond the one I mentioned.

12,593. (*Sir William Savory.*) You mentioned a vesicular disease which you have seen on persons after an attack of small-pox?—I do not know that I have seen them especially after small-pox, but I have seen them at all times.

12,594. Could you give any more precise answer to the question than is implied by the term vesicular disease?—I believe that those vesicular diseases have gone by different names; my memory is very bad for names. I do not mean eczema; it is perfectly different from eczema. Moreover, this vesicular disease is not attended by the itching which you observe in eczema. It comes on suddenly upon a red base; it will come on frequently in the night, and will scale off perhaps in a day or two.

12,595. You mentioned the word “typical” in relation to a vesicle of vaccination, you mean by that I presume that a perfect vaccine vesicle has a character of its own by which you could distinguish it from every other vesicle?—Yes.

12,596. You have, I gather, some experience of vaccination?—Yes.

12,597. You have no hesitation in saying that the typical vesicle has a character which would enable you to distinguish it from any other form of vesicle?—I have not seen a vaccine vesicle which I could not declare to be a vaccine vesicle, but I can perfectly understand that there may be conditions which may modify the vesicle. Although I have not seen it I think it very possible that syphilis being in the system might modify the vaccine vesicle. I think it very likely, but I have never seen a vaccine vesicle which I could not declare to be a vaccine vesicle.

12,598. Then you have told the Commission that you think that vaccination is not protective without the malaise?—I have no reason to believe that it is.

12,599. But is it protective with the malaise?—I have no doubt whatever that it is. I have no doubt that the system will never carry on two distinct disease at the same time.

12,600. But assuming a thoroughly successful vaccination, with abundant malaise, would that be in any way a protection from small-pox?—I believe it would, so long as the virus continued to act upon the system, and no longer.

12,601. How long would that be?—Probably about a couple of years from the time of the person being vaccinated. It would depend, too, upon the age of the person. If a child were growing very vigorously, it might build against the virus more actively than a less vigorous child would.

12,602. (*Professor Michael Foster.*) What do you consider to be the indications of the virus being active?—Symptomatic fever would indicate a disturbance of the system, the case would mature about the ninth or the tenth day. Irritative fever would begin about that time in a child.

12,603. (*Sir William Savory.*) What are the tests for the presence and absence of the virus in the system?—I do not think it can be told at all except by inference that the person is made ill.

12,604. You say the virus protects from small-pox as long as the virus remains in the system, which you think is two years, but people do not remain ill two years?—I

have certainly observed the children who have suffered the irritative fever to become languid and ill, and liable to eczema. Children are liable to eczema at any time, but I think, they are more liable to eczema after vaccination.

12,605. You think the virus remains in the system for two years after vaccination?—It is impossible to say, but I think that the system of a person having absorbed the virus is disturbed for a longer or shorter period.

12,606. And it is only during that disturbance that the protection exists?—I think so.

12,607. That would be for two years?—In children, probably, I should think so, but in an adult person I think it continues longer than that.

12,608. How long would you say it continued?—I have seen two cases where young persons were vaccinated in Taunton, I think about the year 1882 or 1883, these young women became ill, and there was an indication of what I thought to be blood degeneration as though there had been chlorosis. It may have been from the uterine system being disturbed, which we sometimes meet with; we make allowance for that; but in fact it did not behave itself in that way. Chlorosis and uterine disturbance can be built against by treatment, but this did not yield to treatment. I inferred that vaccination had caused it, because these two young women had not had a day's illness before; neither food nor drugs of any kind whatever nor any treatment seemed to do those persons any good; but now, I am very glad to say, that after about four years the system has recovered itself.

12,609. If an adult is protected longer by vaccination than an infant, and the protection depends upon malaise, the adult would suffer from malaise after vaccination longer than an infant?—Certainly, I think so.

12,610. You spoke of “successful vaccination,” will you tell the Commission what you mean by successful vaccination?—What the law considers so. What was successful, for instance, in bringing the half-crowns in, was the typical vesicle. That was returned to the Board of Guardians, and was accepted as being successful.

12,611. But that would not be successful with you unless there was the malaise, would it?—In the pathological sense, it would not.

12,612. Not in a legal, but in a protective sense, speaking as a scientific man?—The system being occupied by this disturbance would not during that disturbance accept another disease.

12,613. Therefore it would not, in your view, be a successful vaccination without the malaise?—It would not be a successful vaccination without the malaise, and then only successful by substitution.

12,614. Can you tell in every case whether there is that malaise or not which renders it protective?—Perhaps the majority of children would have no febrile disturbance. I should not expect to find it if I did not find any disturbance of the system.

12,615. Would it not be rather a difficult thing to draw the line, and say where there is, and where there is not malaise?—Certainly, unless it were somewhat pronounced it would be difficult.

12,616. Therefore how would you arrive at your conclusion as to whether there is or not malaise?—I presume to think that I know when there is irritative disturbance after vaccination.

12,617. Would you tell us how you can ascertain the existence of malaise?—We know it by the child being extremely cross, and by its being feverish; by its temperature being increased.

12,618. What would be the degree of feverishness with you; when should you pronounce the child feverish?—I should pronounce it feverish by its being flushed, by its being unhappy, and by its being restless, not sleeping, and being in fact altogether disturbed.

12,619. You mentioned a rise of temperature?—Yes.

12,620. How would you test that?—You would test it with a thermometer.

12,621. Did you test it with the thermometer?—No, I cannot say that I did test it with the thermometer, but of course one can know when the temperature rises by the flush and disturbance.

12,622. You depended upon that; you did not test it with the thermometer?—I did not.



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12,623. Would the thermometer give you accurate information?—I do not think it would.

12,624. What should you consider, by the thermometer, a sign that the patient was feverish?—I should say, perhaps, 100°, and then it would depend upon what time of the day it was.

12,625. Would you tell the Commission how the time of the day affects it?—Nearly all fevers increase in the evening; the temperature rises in the evening.

12,626. How much would you allow for that?—I would not allow anything; but in point of fact the temperature will vary sometimes as much as a degree or a degree and a half, or even more than that.

12,627. Have you paid any attention to the literature of vaccination?—I have not.

12,628. All your statements are from your own experience?—Certainly.

12,629. You have not paid any attention to the literature on the subject?—No, I am not a partisan in the least. All I state I state from my own knowledge.

12,630. Would a knowledge of the literature imply partisanship, do you mean?—I do not think that it would, but still I believe that I know something about vaccination.

12,631. Still am I to take it that you know something about the history of vaccination?—I know something about it, but I have paid no attention to the figures.

12,632. (*Professor Michael Foster.*) With regard to the landlady of the inn, do I understand you to say that the tramp arrived upon the Monday, and small-pox broke out upon the following Saturday?—That is what she stated to me. I know it did occur, but what the exact days were I do not know. It was known to me at the time that this woman had seen a tramp, and that small-pox had followed. I heard of that at the time when I was residing near.

12,633. But as to the exact period you have no knowledge?—No, that is what she stated. I pressed her specially upon it, because of course it had reference to the period of incubation, which I believe varies.

12,634. Is it usual to have so short a period of incubation, do you think, as from the Monday to the Saturday?—It is very difficult to know when the incubation begins.

12,635. (*Mr. Hutchinson.*) You know when the incubation begins if you know the date of the exposure?—Yes.

12,636. In this case you date from the exposure to the infected baby?—Yes, whether the fact of the landlady being pregnant modified or kept off the incubation or not I cannot say.

12,637. This statement is from memory, is it not?—Not exactly from memory, because I was living in Taunton at the time, and knew pretty much what occurred.

12,638. But does the interval of time between the advent of the tramp and the appearance of small-pox depend upon what she stated?—Yes, it does; but a woman being pregnant is not likely to forget the date when she is expecting her child.

12,639. You have given the Commission a great deal of valuable personal information, and you have seen a great deal of small-pox?—Yes.

12,640. You never avoided cases of small-pox?—No, I always went to them when they occurred in patients of mine.

12,641. Have you ever had small-pox?—No, I have not.

12,642. Have you been vaccinated?—Probably when I was young I was inoculated; vaccination was not so prevalent then.

12,643. Have you ever vaccinated yourself since that time?—No, I have not, and I should not like to do so.

12,644. You had assistants, I suppose, in your practice?—I nearly always had two when I was in active practice.

12,645. Did any of them ever take small-pox?—No.

12,646. Had they been vaccinated?—One of them had; I believe all of them had.

12,647. Did they re-vaccinate themselves?—I believe not.

12,648. Had you any reason to believe that any of them had had small-pox before they came to you?—They had not had small-pox.

12,649. How do you explain the fact that this large number of assistants, who were daily exposed to the disease, did not take it?—It is difficult to say what makes the system accept a particular virus. A virus when it attacks the body must have something to feed upon, and the system must be exposed to some acceptable virus. I imagine the system being perfectly healthy it would not take on any disease, the system would refuse to accept it.

12,650. You have been a careful observer, may I ask whether you think that good health in an infant protects it against scarlet fever or measles, do those diseases pick out only the infants who are in defective health, or do they run through the family?—Scarlet fever is of all fevers the most typically infectious, and the most tenacious in its virus.

12,651. Does it prefer the feeble or the healthy, in your experience?—It is very difficult to say what are the feeble. I know scarlet fever will attack some and will not attack others, but what the exact proneness is due to I do not know.

12,652. Do you think it makes any difference whether a person is in feeble or good health?—I know that a child in vigorous health will not readily accept disease.

12,653. Do not you think that a child in vigorous health will accept scarlet fever as readily as a delicate one?—No. If you have a family of children, two or three of them will take scarlet fever and the others will not.

12,654. Is that due to their being in feeble health?—I cannot say as to that, but to some element of the system which the poison or virus had to feed upon.

12,655. We are quite agreed upon it that some possess a peculiar idiosyncrasy, but have you any reason to believe that feeble persons in a family take small-pox more readily than the vigorous?—It is difficult to say what is feeble. A feeble person in one part may be vigorous in another. One person may have a feeble lung and healthy kidneys while another may have healthy lungs and feeble kidneys; there is no such thing as perfection of the system.

12,656. Do you attribute the exemption of your assistants to their good health?—To their not being prone to disease.

12,657. Do you think that their non-proneness was due to the fact of their having been carefully vaccinated in their infancy?—I do not know that. My experience has not led me to say that.

12,658. You have said that your experience has enabled you to see several cases of small-pox occurring in those who had been carefully vaccinated?—Typically vaccinated.

12,659. What is the shortest period, within your experience, between the performance of a successful vaccination and the occurrence of small-pox?—I cannot say.

12,660. Would not a case in which the interval was very short have impressed itself upon your memory?—I have certainly seen cases in which the interval was very short.

12,661. What is the shortest period that you have observed?—I have not taken any notes of cases of this kind.

12,662. You told Sir William Savory that vaccination protected for about two years?—I also said that I thought vaccination very often did not protect the system at all.

12,663. But supposing it to have been good vaccination do you think you have seen any cases in which small-pox has occurred within two years after?—Before I could answer that question it would be necessary that I should note the amount of typical fever which occurred at the time of vaccination.

12,664. We will leave the question of fever aside, and I will ask you if you have known any case in which small-pox has occurred within a shorter period than two years after vaccination?—Plenty of cases.

12,665. Have you any notes of such cases?—I have no notes of any cases.

12,666. Again I would ask you what is the shortest period you have known?—Very frequently the small-pox when it was epidemic has attacked children within a few weeks after their vaccination; I have seen plenty of such cases.

12,667. After apparently successful vaccination?—Yes, after the typical vesicle. I do not know what you call "successful" vaccination.



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12,668. Have you notes of any one case in which it has occurred after the short interval you have named?—I have not.

12,669. Have you, in your experience, known any of your medical friends fall victims to small-pox?—No, I have not, and it is a remarkable thing that a medical man going from place to place, and seeing these people, should not take the disease.

12,670. Have you any theory as to why they should not?—I have not. I think it is a most dangerous thing to have any theories at all. I regard it as a very remarkable thing, for I do not think with all the egotism that medical men have about them that they can claim any special providence to protect them; but not only do they not take the disease, but they do not convey it to their patients; for as to isolation it is impossible to isolate a human being.

12,671. (*Chairman*). Have you known any medical man in your neighbourhood who had incurred any of the infective fevers?—I have known medical men who have suffered from fever.

12,672. Of what kind?—Typhoid fever certainly. I have known a medical man suffer; I forgot his name, but I have known a case.

12,673. Do you know any other than that?—I do not remember it.

12,674. (*Mr. Whitbread*). May I ask you, when you arrived at the opinion you hold with regard to vaccination, was it before you became a Public Vaccinator?—No; if it had been I should not have accepted the office; but accepting this Pitminster district and when the Board of Guardians, doing me the honour of reposing some confidence in me, asked me to take over for a time the West Monckton district, which I did and held it for seven years, it was part of my duty that I should be a Public Vaccinator. I had to vaccinate, and I did vaccinate, as part of the duty appertaining to the office; but I had this salve to my conscience, that when eczema appeared (although eczema is frequent in children, still it is more frequent and more inveterate in vaccination) I could not help inferring some distinct connexion between the disturbance of the system by vaccination and eczema; so I would never press any person to be vaccinated; and when people asked whether it was desirable to be vaccinated, I always said, "It is my duty to "vaccinate, but I do not press it upon you."

12,675. But I asked, when you became impressed with your present views as to the want of efficacy of vaccination, was that solely from the cases that came under your own observation or was it from reading anti-vaccination literature, or what was it?—It was solely from my own observation; in fact it was irresistible, because so many cases of small-pox occurred after vaccination that I could not suppose that it was effective.

12,676. (*Mr. Meadows White*). How long were you a Public Vaccinator?—I was 20 years and six months Public Vaccinator.

12,677. And when did you cease to be so?—I think it was in 1865.

12,678. How often was there a small-pox epidemic in Taunton during that period?—There was an epidemic in 1849, and about ten years after that, and a third time in 1870 or 1871.

12,679. That was after you ceased to be a Public Vaccinator?—Yes; but I had an interest in the cases, and I was permitted by the medical men whose patients they were to see those cases, and to see where they occurred, and they occurred remarkably in the most insanitary houses, the most crowded places.

12,680. I think you said that Taunton was well vaccinated?—You may depend upon it that where you have medical men who have an interest in vaccination, you will always have the place well vaccinated.

12,681. Taunton was practically well vaccinated?—Yes; none of them escaped.

12,682. At the time of the last epidemic, you had no interest in respect of vaccination in Taunton?—I observed nearly forty cases after the last epidemic, or rather there has been a partial epidemic since that time, but I mean that of 1860. I am not quite sure of the number, I observed, probably four of them had not vaccination marks on the arm, but the others had.

12,683. Were they forty of your own patients?—No, they were not my own patients.

12,684. Was that the whole number of small-pox patients in Taunton during that epidemic?—No, not anything like it, but I only saw those people.

12,685. That was after the time when you had taken these views?—That was after the time when I had anything to do with vaccination, but I was interested in it, because I had been so much impressed with the opinion that vaccination was not a preventive.

12,686. Can you give me the population of Taunton at the time of the epidemic?—The population of Taunton at that time was probably 16,000.

12,687. Can you tell me the number of cases of small-pox in Taunton at the time of the epidemic?—I cannot.

12,688. You saw those forty cases?—I saw nearly forty cases. I should say probably not quite forty cases.

12,689. Did you examine carefully at the time the marks of vaccination?—I did examine them carefully.

12,690. But at that time you had ceased to vaccinate; they were not your patients?—I was only in private practice at that time. May I be permitted to say that in 1867 or 1868, cattle disease broke out in West Somerset and it was especially inveterate about Bicknoll and Curland, where mostly my patients were in that part of my district; and both myself and my assistants took vaccine lymph from the arms and vaccinated the udders of cows, and not only of cows but of heifers, and in no one case out of a great number that we did, did it produce any vesicle at all like small-pox or even like vaccination; it was simply like a little abrasion, not the least like a vaccine vesicle.

12,691. (*Chairman*). What do you deduce from that?—I infer that vaccination is not reciprocal between the human being and the cow.

12,692. What was the disease that you observed in the cow?—It was a kind of pleuro-pneumonia that they were suffering from, and just about that time or before then it was supposed that vaccination would keep off distemper from a dog, and their ears were vaccinated. The farmers were very desirous that vaccination should be tried upon those cows and I allowed my assistants in two or three instances to vaccinate some cows that were presented to me and they did not take the vaccination. I also made many such unsuccessful trials.

12,693. Has any person who has studied the question carefully observed the least connexion between cattle plague and vaccine?—No; I believe not; but I was asked myself if I would vaccinate some cows.

12,694. Does that bear upon the question whether vaccination protects from small-pox?—No, I only speak of it with regard to the question of vaccination and the cow.

12,695. (*Mr. Meadows White*). You saw those 40 patients you say; did any of them die?—No, they did not.

12,696. You have no notes, you say, of the cases, but were any of those cases very virulent cases?—There were some of them very virulent cases.

12,697. How many of them?—I do not know what proportion, but there were several of them.

12,698. How many of the 40 did you observe who had no marks of vaccination?—I think about three or four.

12,699. You cannot give me at this distance of time any of the circumstances of any particular case, that is to say, you cannot say to what infection they were exposed, or when?—I think it was some condition of the air.

12,700. But you cannot tell me the circumstances under which the infection was taken?—No, except this; that it always occurred in the worst parts of the town, the most crowded parts, and what might be termed the most insanitary parts of the town, such as, for instance, those parts leading out from Silver Street, and the alleys from Paul Street, and the worst parts of East Street; the darker and more crowded parts of the town.

12,701. It is no use pursuing that subject further if you say that none of them died. Can you remember with any distinctness the patients on whom no marks were seen?—No, I cannot tell you the names.

12,702. You cannot tell us whether the attacks were generally mild, or whether they were severe?—No; but I must mention two cases of Scotch travellers who were in lodgings in a house in East Street, the home of



their employer ; they lived with a Mr. Cameron. One of those men had been vaccinated and the other had not; they both had small-pox, and the one who had been vaccinated had small-pox much more severely than the one who had not been vaccinated.

12,703. Were those two of the 40?—No, they were incidental cases and it had nothing to do with the cases I was referring to.

12,704. (*Dr. Collins.*) I understand that the evidence you have given to the Commission to-day is drawn from your personal experience?—Yes.

12,705. Having been for 20 years a Public Vaccinator, and having experienced three epidemics of small-pox?—Yes.

12,706. I think you still hold an official position in your county?—I am practically coroner for the western division, for, although deputy, the coroner is disabled, and I do all his work.

12,707. As I understand, your views upon vaccination have undergone a change?—I had no views upon vaccination; I accepted vaccination as being orthodox in the profession. It was part of my duty as the public officer to vaccinate; but after seeing these epidemics of small-pox I had become impressed with the conviction that vaccination was not preventive.

12,708. Starting with no views you have come to a conclusion which is opposed to the efficacy of vaccination?—Yes. Of course, being very young I accepted the views which were generally held. For a long time I did not give way; it staggered me, certainly, but I have no prejudice. I am not an advocate either on one side or the other. I only say that I see that vaccination is not a preventive of small-pox.

12,709. Have you ever been connected with any anti-vaccination organisation?—Never. I should scorn to hold any prejudice, and alliances of that kind, I think, are not suitable.

12,710. Altogether, I think I understand you to say that you have seen between 500 and 600 cases of small-pox?—Yes, possibly.

12,711. Of those, I understand you to say that you ascertained at least 300 to be vaccinated?—Yes, I should think a good deal more than that.

12,712. How many did you ascertain to be unvaccinated?—I did not ascertain the number at all. I stated that, practically, nearly all were vaccinated; very few people escape vaccination in Taunton.

12,713. When you make that statement that very few escape in Taunton, I apprehend that hardly applies to the year 1848 when the first epidemic occurred?—No, it would not.

12,714. That would have been before the first compulsory law of 1853?—No doubt.

12,715. You told the Commission the details of one unvaccinated case—that of a gentleman who had led an erratic life—and also that of one of the two Scotch gentlemen living with Mr. Cameron?—I told you of two of Mr. Cameron's assistants living in his house, one of whom had been vaccinated to the extent of a typical case; that man had small-pox, and the other who had never been vaccinated had small-pox also; but he who had never been vaccinated had small-pox lightly, while he who had been typically vaccinated had it severely.

12,716. Could you tell us the details of any other unvaccinated cases besides those?—No, I do not know whether I can now tell you of any.

12,717. Could you tell the Commission of any unvaccinated cases of small-pox which terminated fatally?—No, because every one has been vaccinated as much as he has been christened within late years, no child practically escapes vaccination. But taking for instance the case of children who had hydrocephalus, none of whom ought to be vaccinated, I am sorry to say that I have seen sometimes in this order as to vaccination not that discrimination against vaccination exercised which ought to be. The temptation to earn money is perhaps a little too great; but certainly in epidemics of small-pox I have never seen children who had hydrocephalus, or possibly hip disease, attacked by small-pox.

12,718. I understand you to draw a distinction between "successful" vaccination in the sense as understood by Boards of Guardians and that "pathological" vaccination, as you termed it, which produced malaise?—Yes.

12,719. Could you give me any idea what proportion of "successful" vaccinations in an official sense would

be "pathological" vaccinations in your sense?—I think more than half of them certainly escape any disturbance of the system.

12,720. Whereas I understand from you that not one in 300 vaccinations fails to be "successful" in the official sense?—Not one in 300 certainly, probably not one in 500; they hardly ever fail.

12,721. Do you remember any patients vaccinated by yourself, who subsequently suffered from small-pox?—I am quite sure that when I had those two districts and a large private practice, a great number of those I vaccinated had small-pox afterwards, but I do not remember their names. Since I have been out of general practice I have discarded my books and all those memoranda; I have not even my day book at hand; I simply take fees.

12,722. Do you think you could trace the post-vaccinal small-pox in Taunton to the vaccination having been done in a manner that was untypical or unsatisfactory?—I cannot. There is but one way of vaccination, that is, with the points. It is said sometimes that a great number of punctures should be used, but I cannot understand that that should be so, because one bite of a cobra will envenom, and one syphilitic point will render the whole system syphilitic; or one bite of a rabid dog if it does inoculate at all (but of course a vast number of bites may occur without rabies following) would be as effectual as if it were from twenty punctures.

12,723. Apart from that theory, did you find that the virulence of small-pox in Taunton varied at all according to the number or visibility of the marks?—I did not notice that.

12,724. Did you pay attention to that point?—I did not.

12,725. Did you see numerous marks of vaccination in persons suffering from small-pox?—The ordinary number in vaccination would be three marks. I have seen a great number suffering from small-pox with such marks.

12,726. I believe there are printed rules, are there not, for the guidance of Public Vaccinators?—Not in my time. I was not guided by any such rules, but I regarded none as practically vaccinated unless the vesicle became typical; and although I did not rely upon one vesicle, yet my inference would be that one typical vesicle would afford as much protection against small-pox as 20 would.

12,727. Could you tell me whether the use of the clinical thermometer is required from Public Vaccinators to show when fever accompanies vaccination?—Not at all, and I do not know that it would be much use.

12,728. Do you know the source from which the lymph was derived which was employed?—I do not know. I always took it from child to child.

12,729. You do not know its remote origin?—I do not. I have heard it said that it has several sources, but I have not gone into that. I have not read some books which have been lately published. I should like to see Professor Crookshank's book, because I think he is probably a competent man. A number of other things which have been published I should not care to read even if they were put before me.

12,730. You told the Commission of a number of interesting experiments made by your assistants with regard to the inoculating of vaccine in the case of the cattle disease?—Not only by my assistants; we made a transference of vaccine matter to the udder of a cow; but the cow might have its udder in an unhealthy state, bruised and so on; I was not content with that. The question was whether the uninjured udder of a heifer would take it, and I found that in no instance it would take it.

12,731. Was the disease which was prevalent among the cattle, cattle-plague or pleuro-pneumonia?—It was pleuro-pneumonia.

12,732. It was put to you by the honourable Chairman whether you were aware that any one who had carefully investigated cattle-plague and vaccine thought there was any connexion between the two, and you answered, No?—I do not know whether they believed it, but there were such vague ideas in the public mind with reference to vaccination and its influence that there was a wish for experiments to be made, and I yielded to the desire. I could not prove any relationship, and I did not believe in any relationship, but I made the experiments; I yielded to their solicitation. My opinion was that the two things could not have any relationship.

Mr.  
G. Cordwint,  
M.D.

21 Jan. 1891.



Mr.  
G. Corduent,  
M.D.

21 Jan. 1891.

12,733. I gather at any rate that the assistants you employed were not protected from small-pox by re-vaccination?—No, they were not.

12,734. Can you give the Commission any information upon the subject of the objections made to vaccination on account of the injurious effects alleged to result therefrom?—I do not know what the opinions of others are, but my impression is that eczema becomes much more inveterate after vaccination in children; you get eczema in children certainly under any circumstances without vaccination, but I think that eczema is more severe and more persistent after vaccination. I have also observed in some cases abdominal disturbance and malaise in children; they look unhappy and weary, and they continue to be so, and the flesh to remain more flaccid.

12,735. Have you seen any other effects which, in your opinion, result from vaccination which are injurious to health?—In such cases as neck glandular enlargement, but that glandular enlargement may pertain to any irritation of the skin; the poison would go to the glands. But certainly I have seen abdominal disturbance without external disturbance. In all children that may be from constitutional mesenteric disease; I cannot prove that it was not so, but my inference is that constitutional disturbances were more frequent after vaccination, that vaccination in fact did disturb the constitution.

12,736. Did I correctly understand you that the limited protective influence which you consider there to be in vaccination lasts only during the existence of malaise?—During its own disturbance.

12,737-8. Would you regard it, as a former witness stated to us, more in the light of a temporary antagonism than a protection?—It very difficult to say what is antagonism; I do not know what antagonism is. I suppose that a real disease will in fact alter some vitality in the system. Pathology has not advanced sufficiently far to say how that is, but some molecular change in the system will be introduced by a certain thing. Take small-pox; those who have had small-pox never get it again; I do not believe in it occurring a second time although there may be a disease approaching it in similarity; but after 50 years' experience, I never saw anything that could be certified at all justly as a second attack. A person gets syphilis, and that syphilis will continue for years, and will modify the condition of the system. But a person will not get syphilis a second time. I believe that an abominable experiment was made some 40 years ago, and that persons were in point of fact syphilised artificially, and it was said they did not get it. I know that a person will not get syphilised a second time. It is a real disease, but vaccination is not a modified small-pox. If you take small-pox and inoculate small-pox, by some change in the vitality, of which we do not know sufficient, you will not have small-pox a second time.

12,739. Would the statement that a second attack of small-pox will not follow a previous attack of small-pox go any further than as being derived from your own experience?—I have seen cases of small-pox 50 years ago, and I can say that during my whole experience those persons did not have small-pox a second time.

12,740. Would that experience of your own lead you to say that it is not possible for persons to have small-pox a second time?—We have not advanced sufficiently in pathology to say what is impossible, but it has not occurred.

12,741. (*Sir William Savory.*) What has not occurred?—Small-pox a second time.

12,742. Has it never occurred?—It never occurred within my practice, but I have heard of it occurring a second time, and I have made inquiry and found that it was not small-pox.

12,743. Do you believe in the occurrence of small-pox a second time?—I do not believe in the least in it.

12,744. (*Dr. Collins.*) That opinion is based upon your own experience?—It is based upon my experience and is based upon analogy too.

12,745. Agreeing with you that there is some difficulty in understanding what is meant by antagonism, I want to be clear as to the relative influence of vaccination and small-pox against a future attack of small-pox. For instance, Sir John Simon states that "the safety of the vaccinated is of the same sort as if they had been inoculated under the old process or had been infected by the natural disease"?—I am sorry that I cannot concur with so great an authority.

12,746. What do you say to this opinion of the same authority, that "against the vast gain by vaccination there is no loss to count by way of injury or disease resulting from it"?—I do say that there is a disturbance of the system, and it is not a very unlikely thing I must say that an element passed into the system and producing such disturbance in the system as would alter the vitality of that system can possibly be without some disturbing effect of its own. Say a child is teething, there is an alteration in its condition. After shedding one set of teeth, another is coming up, and that child becomes ill; there is a disturbance set up. It then goes on to puberty, and a change takes place in the system; we do not know what may develop under that change; consumption, or some family evil, may develop itself on account of the disturbances that are produced. Is it to be supposed that vaccination which alters the vitality of the system should not produce some change? But I do not come here to reason upon the matter although I have not practised without some reasoning, I hope.

12,747. Putting on one side the temporary protection during the continuance of the malaise, and on the other the malaise itself, would the result be of value, or otherwise to the constitution?—A temporary substitution, I will not say protection, is set up, I have never seen two diseases, if they are well developed, carried on at one time, it is a balance, it is not a protection. One disease is substituted for the other.

12,748. Is it or is it not an advantage to the individual?—I should not take it to be so. I may say, that I had much rather, if it were to be submitted to myself, that I should take small-pox at a time when it was not epidemic. Take a healthy child at a time when small-pox was not epidemic and inoculate that child, and the disease would not spread; diseases will not always spread. I believe there is great error in supposing that a disease is always infectious. A disease which is infectious at one time is not infectious at another. That inoculation would be permanent, and you would not have small-pox again. But supposing that vaccination did all the good it was supposed to do, you would have to re-vaccinate every five or six years, and that could not be unattended with its disturbance. Re-vaccination in an adult is a very severe thing. I have seen some very severe cases from it.

12,749. You would not regard vaccination as a substitute for inoculation?—Certainly not; inoculation is the introduction of the real disease. But I would only say that I have not seen a case of small-pox occurring a second time, nor do I believe small-pox or any disease will always become infectious. If I may be permitted to do so I will state a case where a man had been in the habit of passing some sewage pipe every day several times, and he was warned by his people to have that set right; however he was very fond of saving his money and would not go to that expense. By-and-bye typhus became prevalent in the town, not near him, and some cases of diphtheria were prevalent; and this man then had typhus fever and died within a week. I infer from that that the same poison which exists at one time will not without some cosmic influence in fact produce a poison in the system, but that some cosmic influence brings about the efficiency of it.

12,750. You would regard the cow-pox poison as different apparently from the small-pox poison?—You can vaccinate and the vaccine will always take, but it will not always prevent small-pox, whereas small-pox occurring once will not recur.

12,751. Do I correctly understand you to say that you have seen children suffering from small-pox within a few weeks of their vaccination?—I have.

12,752. Can you give the Commission any information as to what means other than vaccination could be used for diminishing the prevalence of small-pox?—All diseases can be diminished by sanitation, and I suppose by the nice selection of healthy parentage. If we were to have the selection of healthy parentage and no unhealthy life, you would have no diseases at all; people would live to a very old age, and then go off in sleep without any disease at all.

12,753. Could you give the Commission any more practical suggestion than that?—I cannot.

12,754. Have you any suggestion to make as to the prevention of epidemics?—The only thing I can say is to remove insanitation in any way whatever.

12,755. Is that opinion based upon having found small-pox prevail more in insanitary quarters than elsewhere?—Certainly, and markedly so in Taunton.



12,756. (*Dr. Bristowe.*) Did I understand you to say just now that cow-pox could not be conveyed from a cow to a human being, and conversely?—Certainly, I cannot say whether it would be conveyed from a cow to a human being; I have had no opportunity of observing that; but I say that from the human being to the cow it cannot be conveyed.

12,757. That is the result of your experience; you have no knowledge of it otherwise?—No, I have no knowledge of it otherwise than in the period I speak of, and the many trials made by myself and my assistants.

12,758. It is your own personal opinion?—I have no opinion about the matter at all; I only say that is what I observed.

12,759. You said just now that two diseases were not possible at the same time?—I have not observed two diseases at the same time, nor do I believe in their existence.

12,760. Yet you quoted a case, did you not, in which cow-pox and small-pox existed at the same time, and ran their course?—That is that the vaccine vesicle existed at the same time; but I have over and over again said that the vaccine vesicle does not imply impregnation of the system.

12,761. Still it is a disease?—Nine times out of ten it would be a local disturbance only.

12,762. But still a disease?—It would be a disease if it were imbibed into the system, but it as often as not is not imbibed into the system. When the system became infected with the virus of vaccination it would be a disease.

12,763. Have you observed that whooping-cough and measles are frequently taken together?—I have not, but I have frequently observed that they will follow each other. I have not seen them together. I have seen the measles which began in the air passages and a cough existing, but I have not observed the real whooping-cough and measles co-existing, although I have seen them following quickly one upon another.

12,764. Then would not you believe it to be possible that small-pox and chicken-pox could exist together?—Yes, I would believe that it was just possible, because chicken-pox is a disease which so very little disturbs the system. I do not know what is possible in fact.

12,765. Then you would admit that two diseases may exist together?—It is very possible that such a thing might be; it has not come within my own knowledge. I do not believe that chicken-pox, if preceded by much fever, would co-exist with small-pox, or that with small-pox, if it were severe, you would have chicken-pox at the same time.

12,766. If I tell you that I have seen it you would doubt me?—All that I can say is that I have not seen it myself.

12,767. In answering Sir William Savory's question you spoke of having noticed the peculiar behaviour of small-pox in reference to vaccination?—I have not seen any behaviour of it at all in reference to vaccination.

12,768. I am quoting your words, I do not know their meaning?—I do not know the meaning of that either, but this is what I think I said: that I saw the vaccine vesicles co-existing with the small-pox vesicles, that they proceeded *pari passu*.

12,769. I merely asked you what was meant by that phrase which I took down?—I fear I must have badly expressed myself.

12,770. (*Sir Edwin Galsworthy.*) I do not quite understand whether your view is that vaccination is no protection at all against small-pox, or that it is a protection for a temporary period?—If vaccination sets up a constitutional disturbance, during that constitutional disturbance small-pox will not invade, according to my belief.

12,771. How long might that constitutional disturbance last?—I have generally found when children are disturbed by vaccination, that it continues for about a couple of years, if not longer; it is difficult to say if you are not watching a child from day to day how long the malaise continues, and it is difficult indeed to say whether it is due to the vaccination, but my belief is that it is due to it.

12,772. You would believe it to last about two years?—For the time at all events of its own disturbance.

12,773. You told the Commission that of the two men in the service of Mr. Cameron the one who had been vac-

inated had the small-pox more severely than the other; what conclusion do you draw from that?—There is but one conclusion to be drawn from it, that the unvaccinated one had small-pox lightly, whereas the one who had been vaccinated was not protected by his vaccination, and that he had it severely. I do not say it was worse on account of the vaccination, but that he was not the better for it.

12,774. Do you think that vaccination tended at all to this person getting the small-pox?—Not in the least; I do not think it affected it at all.

12,775. About what age were those young men?—They were both young men engaged by Mr. Cameron to travel about with his merchandise.

12,776. What was the object of your mentioning it; was it because one had been vaccinated and the other had not?—I do not say that it was because of the vaccination.

12,777. Would you draw any conclusion from an isolated case or from two cases?—No, if those cases stood alone I should take them *quantum valeant*, just as microscopic portions of evidence. I only give those cases as an example of hundreds of other cases which have occurred within my knowledge.

12,778. Do you believe in re-vaccination as being a protection amongst small-pox nurses and attendants in hospitals?—I think re-vaccination when it does disturb the system will disturb it more inveterately than is the case in a young person, because the changes of childhood being very rapid, and the tendency of life being to return to the balance of health, a child will return to the balance of health more quickly than an adult will.

12,779. Do I understand you to admit so far as this, that re-vaccination is a protection against small-pox in nurses and attendants and persons who visit small-pox cases?—Yes; if it sets up its own disturbance I think it would prevent small-pox to that extent, and only to that extent.

12,780. (*Mr. Meadows White.*) Is this insanitary part of Taunton that you spoke of more crowded than other parts?—It is so in every town I have seen.

12,781. But the part that you are alluding to, is that the most crowded part of Taunton?—Yes.

12,782. You were in Taunton some years, is it your experience, that two years is the average duration of malaise in a child after vaccination?—It is difficult to say when malaise begins, and when it ends.

12,783. If you vaccinated a child, would you expect to see the child ill for two years after vaccination?—I should not expect to be called in to attend the child during those two years, but from what I have seen, I should consider that the child would be more or less affected for two years.

12,784. Would an anxious mother notice a disturbance in the child during two years?—I do not know that the mother would; I do not know that they would trace any relationship to the vaccination; but I know that mothers have stated that they have observed that a child has not been so well after vaccination, and I have observed it also.

12,785. You say that the malaise is more pronounced in an adult than in the case of a child; in the case of an adult, would you suppose that he or she would note a disturbance of the system during two years or more?—I have noticed what is supposed to be blood degeneration in persons who receive the vaccine virus into their system when adults.

12,786. Do you suppose that after re-vaccination it would be noticeable to the person himself or herself that there was something unusual?—Yes, I should not have the slightest doubt of it; I am certain of it.

12,787. (*Sir William Savory.*) In your opinion should vaccination be practised or not?—I should say it should not be practised, because I see no justification in it.

12,788. In your opinion the practice of vaccination should be discontinued?—Certainly.

12,789. When did you arrive at that opinion?—I arrived at that opinion perhaps 20 years ago.

12,790. Have you continued to vaccinate since you arrived at that opinion?—I have not except when it has been urged upon me. In a few cases I have consented when persons have urged it upon me.

Mr.  
G. Cordwint,  
M.D.  
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21 Jan. 1891.  
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Mr. G. Cordwint, M.D.  
21 Jan. 1891.

12,791. When persons have come to be vaccinated you have advised them not to be vaccinated?—I have.

12,792. And have you given those instructions to your assistants too?—Since I have ceased to be a Public Vaccinator I have kept assistants, but I have always, when patients have come to me for vaccination, given an unfavourable opinion in every instance.

12,793. At what period did you resign the office of Public Vaccinator, how long ago?—In 1864, I think.

12,794. On what account?—Because I thought the Board of Guardians had behaved dishonourably to me.

12,795. From other causes than the question of vaccination?—Not on that account, but will you allow me to say that the office of Public Vaccinator for the borough of Taunton was open to me; I did not apply for it; I am certain I should have been appointed to it if I had.

12,796. I do not desire to trouble you upon that matter; you have not been Public Vaccinator for 25 years?—Certainly.

12,797. But you have continued to vaccinate since then?—I beg pardon, I have yielded to the desire of persons when they have wished to have their children vaccinated. Seeing that there was some doubt about it, I did not feel justified in saying I would not vaccinate, because if I had declined others would have done it; but I have always advised unfavourably with respect to it.

12,798. And your assistants, have you instructed them to the same effect?—Certainly; they knew that my opinion was unfavourable.

12,799. (*Sir Edwin Galsworthy.*) In how many cases have you refused?—I cannot say, because when I was in private practice taking fees people did not come to a man in my position for vaccination seeing that there was a Public Vaccinator who vaccinated without any charge.

12,800. But I want to know in how many cases, or about how many cases, have you advised against vaccination and yet vaccinated?—Five or six, or even possibly twenty; I do not know. I have sometimes yielded to the desire, but it has always been with a monition against vaccination, that is to say, that it was of no service, that I did not think it prevented small-pox although it was said that it made small-pox more mild. I told them that possibly it may make small-pox more mild, but that my opinion of vaccination was not favourable. I did not apply for this somewhat lucrative appointment of Vaccinator, which I am quite sure I should have been nominated to, because I was unfavourably impressed with respect to vaccination.

12,801. (*Chairman.*) I think you said there were more than 40 cases of small-pox after vaccination of which you observed that none died?—Those cases which I observed which had been vaccinated could not have died because I observed those cases which had suffered from small-pox. I will not say there were 40, but none of them died.

12,802. Would it not have been a remarkable fact in former times if amongst 40 persons with small-pox, none of whom had been vaccinated, none had died?—I do not know that, because of course the tendency of a disease is to cure itself, and people now have a better chance of getting well than they had 40 years ago, because the houses are better and the drainage is better.

12,803. Is there any record in which the deaths from small-pox are so low as  $2\frac{1}{2}$  per cent.?—I do not know that there are, but I think you mistake me. With regard to those cases of small-pox, I asked permission of the district doctor to allow me to see his cases, and I went round to see them; those cases that I saw had had small-pox; only two or three of them were suffering from small-pox at the time; the others had passed through the small-pox when I observed them.

The witness withdrew.

Mr. CHARLES ALLEN FOX, M.R.C.S., examined.

12,818. (*Chairman.*) You are a member of the Royal College of Surgeons of England?—Yes.

12,819. You used to reside at Cardiff and now reside at Ross in Herefordshire?—Yes.

12,820. And you have, I believe, seen many cases of supposed injury following vaccination?—Yes, it would appear so.

12,804. I understand you to say that out of 40 cases you observed none died?—I had seen those cases after they had recovered; I had nothing to do with those cases; they were not patients of mine; they were the parish doctor's cases, and I was permitted to see them.

12,805. Could you tell the Commission the percentage of deaths among the whole of the persons who had small-pox in Taunton at the time you speak of?—I cannot.

12,806. It was probably not very large?—No; the only persons I have known die in small-pox have been about three. One of them was that Mrs. Pote who died in her sixth month of pregnancy. There were two, I think, died in the parish of West Monckton, but I forget the particulars.

12,807. Then you have observed three deaths in from 500 to 600 cases?—Yes; I think so.

12,808. Is there any record in any former period of so small a mortality from small-pox?—I think not.

12,809. Is there then nothing to be said as to the probability of vaccination having diminished the mortality?—I am not prepared to say that it has no influence upon mortality from small-pox.

12,810. Therefore it may possibly be the means of saving many lives?—It may possibly be the means of doing that, but at the same time persons who have been vaccinated have, according to all medical evidence, had small-pox as severely. I do not know what the vitality may have been, but they have been, in many cases, cases of confluent small-pox. Fifty-five years since when I was a pupil in Somerset small-pox developed as now and not otherwise—severe cases were preceded by high fever, pains in the back and head, and often delirium preceded the eruption, but the treatment was so vastly different that only the most elastic vital force allowed of recovery. Drugs were given at night and day, and if diarrhoea assisted the oppressed kidneys that was instantly treated as disease, and its suppression viewed as an achievement, whilst a pestiferous closed-stool made of wood was kept close to the patient's bed side.

12,811. Have you looked at the comparative records showing the proportion of mild and severe cases after vaccination as compared with those which were not vaccinated?—I have not observed the proportional results; nearly everyone was vaccinated during my time. Some of those cases of small-pox were severe and some were mild.

12,812. You have not consulted to any large extent the records or the statistics?—I have not, except that I have seen the records of the last century, or the early part of this century, showing about 18 per cent. of deaths.

12,813. Has there any percentage equal to that been observed in any district of England within the general practice of vaccination?—Certainly not within my observation to anything like 18 per cent.

12,814. And you are not disposed to accept the fact of second cases of small-pox occurring after a previous attack?—I have never seen such a case.

12,815. But do you doubt the records made by medical men and by others?—I have heard a medical man say that he had seen small-pox occur three times. All I can say is that I have never seen such a case, and I have never heard any other medical man say so.

12,816. Are you aware that cases of that kind have been frequently recorded?—I daresay, but I should imagine that it may have been mistaken very likely for some vesicular disease.

12,817. Are you not aware that cases have been recorded in which persons have died from a second attack of small pox?—I am not aware of that. If there were such a case, I should like to have all the particulars of it before I should believe it.

Mr. C. A. Fox, M.R.C.S.

12,818. (*Chairman.*) You are a member of the Royal College of Surgeons of England?—Yes.

12,819. You used to reside at Cardiff and now reside at Ross in Herefordshire?—Yes.

12,820. And you have, I believe, seen many cases of supposed injury following vaccination?—Yes, it would appear so.

12,821. Will you give an account of them; have you any cases recorded?—Yes, I have them before me in a pamphlet which I have prepared.

12,822. How many cases have you recorded?—I have 80 cases recorded.

12,823. (*Dr. Collins.*) Do I understand you as submitting those cases as cases of injury arising from



vaccination?—I do not say absolutely that they are, but I submit that they should be considered with such a view.

12,824. And some, if not the greater portion, you have visited yourself?—All I could, and of others I have my knowledge generally from near relations.

12,825. (*Mr. Hutchinson.*) Have you any case of communication of syphilis, or anything of that kind?—Yes, undoubtedly: I have several cases of that descrip-

tion which I think would be so considered by authorities upon that subject. I do not pretend to say whether they are, because I have generally had to go by the accounts of the parents.

12,826. (*Mr. Meadows White.*) I think you state in your pamphlet generally the amount of personal knowledge you have of the cases?—Wherever I have attended them I have stated it, but I have seen others. The subjects of them have been seen in the majority of cases.

The witness withdrew.

Adjourned till Wednesday next at 1 o'clock.

## Fifty-third Day.

Wednesday, 28th January 1891.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary.*

The Right Honourable JAMES STANSFELD, M.P., examined.

12,827. (*Chairman.*) You are Member for Halifax, and were at one time President of the Local Government Board?—I have twice been President of the Local Government Board.

12,828. In that capacity your attention has necessarily been directed to the subject of vaccination?—To a certain extent.

12,829. The administration of the vaccination laws comes under the jurisdiction of the Local Government Department?—It does.

12,830. Will you be so good as to inform the Commission generally what is your opinion of vaccination?—I am not competent to express a professional opinion upon the subject of vaccination; but my state of mind generally is this: that looking to the heavy balance of medical opinion in favour of the practice of vaccination, I feel bound to hold that there is a sufficient case for what I would call "moderate compulsion."

12,831. How would you define "moderate compulsion"?—I would define it by reference to Mr. Forster's Select Committee and Bill, without, however, binding myself to that special method. It was proposed by the Select Committee of 1871, and by Mr. Forster's Bill, that persons who have been fined 20s. or have been fined in two penalties of any amount should be exempted from any further proceedings. Upon that line there seems to me to be a possibility of what I call moderate compulsion; of course I cannot be unconscious of the objection to the very phrase "moderate compulsion." One might say that compulsion, if it exists, ought to be effective, and that "moderate" or "immoderate" are not terms to be logically applied to it; but I think that a sufficient answer to that objection may be found in this observation: that the inconsistencies and objectionable features of the present arrangement are at least as striking as any such objection to a limitation of the penalty.

12,832. Do you refer to the inequality in the administration of the law?—Yes, that is one of the objections; and perhaps I may just as well at this point state the heads under which I would classify the objections to compulsory vaccination as at present enforced. I would range them under four heads: First, the inequality in the administration of the present law, and a certain conse-

quent injustice; perhaps I should say a certain but not an ascertained quantity of injustice. Secondly, that the present law fails to effect its purpose of complete protection, and is incapable of fully effecting it. Thirdly, that vaccination, as at present practised, sometimes inflicts serious injuries; and fourthly, that the system of paying Public Vaccinators is objectionable. If I am asked to state my reasons with regard to each of these propositions, it will be understood that none of my opinions will imply the possession of any professional knowledge upon the subject, as far as I am concerned.

12,833. Will you tell the Commission first what are your grounds for deprecating the inequalities in the administration of the law which, in your opinion, tend to work injustice?—At present there is not equality in the enforcement of the law. Some Boards of Guardians, as at Leicester, Keighley, and other places, refuse to enforce the law altogether; others, I am told, have suspended proceedings pending the Report of this Commission; others press parents to vaccinate, and are content to threaten proceedings; others prosecute once only, and others to the last extent. The result is that you have occasionally the case of a man being fined as much as 75l. altogether. I understand that there are some cases of fines amounting to something like that sum of money, and being sent to prison for a total of several months, because they refuse to vaccinate their children. In view of those circumstances, what I would say is this: that though it appears at first sight objectionable that the law should decline to punish repeated offences, as Mr. Forster's Bill proposed, yet one of the objects of the law ought to be to secure uniform obedience to it, and if possible the law ought to be one to which uniform obedience, or something like uniform obedience, can be rendered. The alternative which we have created by the present system is the existence of districts where no effort at compulsion is made, and the fact that if an anti-vaccinator can remove into any one of such districts, he entirely escapes the operation of the law. On the other hand, the law suggested by Mr. Forster's Committee could have been enforced. A clause to that effect in the Bill of 1871 did pass the House of Commons, and was only defeated in the House of Lords—fifteen Peers voting—by one

Mr.  
C. A. Fox,  
M.R.C.S.

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Right Hon.  
J. Stansfeld,  
M.P.

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J. Stansfeld,  
M.P.

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vote. I do not bind myself to the details of that clause, but it seems to me that it is some reply to the argument that compulsion ought not to be imperfect; that it is at present imperfect and unequal.

12,834. The imperfection being roughly, if I may say so, local?—Yes, so far as I have at present gone it has been local. There are other imperfections to which I shall come in the course of my evidence.

12,835. The injustice to which you refer is, that it depends upon the particular locality in which the individual is whether or not he is compelled to obey the law, and the extent to which he suffers for not obeying it?—Yes, the unequal incidence of the law is to a certain extent an injustice.

12,836. Is that all you have to say upon the first head?—Yes, upon the head simply of inequality of administration.

12,837. Then we will pass now to your objection that the present law fails to effect its purpose?—There are many persons who continue absolutely to refuse to obey the law: they are persons in all classes and ranks of society; and I am under the impression that the number is increasing. I could not undertake to say definitely that it is, but that is the impression I have. Now to make martyrs of those opposed to vaccination by persistent and repeated punishment seems to me to be at least injudicious. You do not succeed with them, and you produce generally an impression of harshness and injustice which provokes opposition and strengthens resistance. Therefore I do not think that system is the proper way in which to induce compliance. Now the principle of compulsion would seem to require that it should be absolutely carried out, at any rate unless you can show practical reasons to the contrary, and I am considering those practical reasons; but you could not absolutely carry out the law of compulsion; it never has been done, and it cannot be done.

12,838. It could only be done if public opinion would support your taking a child from the parent, however unwilling he or she might be, and having it vaccinated?—Yes, taking the child from its parents and having it vaccinated; that could only apply to primary vaccination; but no one now maintains, if I am correctly informed, that infant vaccination is an absolute protection against small-pox for the whole of life; as I understand, there is no difference of medical opinion upon the subject, but that adult re-vaccination is a necessity, and some people say it is a necessity that vaccination should be repeated more than once. I would say that it is impossible to contemplate a law of compulsory adult re-vaccination. The present system therefore would appear to me to be necessarily, to an extent which I will not define, inefficient, because immunity and complete protection under it cannot be secured.

12,839. Do you think that limiting the penalty to a single imposition of it would meet the difficulty which arises from a strong opposition to vaccination?—I could not undertake to say; I wished to guard myself originally as to that by saying that I did not wish to be bound by the details of Mr. Forster's Bill. My position is this: that absolute compulsion is impossible; you must adapt yourself to circumstances and conciliate public opinion: a *via media* must be found.

12,840. Whether you imposed one or several penalties, do you think you could secure vaccination in the case of those who have distinct conscientious objections, or objections induced by the belief that it will do mischief?—I do not think you would then; and I do not think you do now. I think you could by a method of that kind overcome what I may call the *vis inertiae*, the carelessness and negligence of parents.

12,841. The utmost that such compulsion would effect would be, would it not, to overcome carelessness; that is to say, to compel people to vaccinate who would otherwise neglect to do so merely from carelessness; you would not by that means compel people to vaccinate who avoided it from conscientious reasons?—I think it would do more than overbear mere carelessness; it would overbear some reluctance.

12,842. Supposing that you had the one penalty, might not you still have the same result, only to perhaps a mitigated degree, which you now have, of people refusing to pay that penalty and going to prison?—Yes, in a very mitigated degree, I think. May I interject here that I think the administration could be improved, with the effect, to a certain extent, of conciliating public

opinion, by the suggestion which I propose to make further on of somewhat decentralizing the supervision of vaccination.

12,843. Have you considered the question whether it would be possible to require of those who have a conscientious objection to vaccination some act indicative of it which would be no more easy than taking the child to be vaccinated if there were no objection entertained by them, so as to secure, if possible, that it was not made a mere pretence; and to take such act or declaration made in that particular way as an excuse?—I have not considered that question, for I have not hitherto heard of the proposition. I could hardly answer that question without considering the form the indicative act would assume; but at the moment the idea rather strikes me as one worthy of consideration.

12,844. Have you concluded your evidence upon that point of the failure of the present law?—Yes, for the present purpose, I will return to it by and by, with your permission.

12,845. Your next point is that vaccination, as at present practised, sometimes results in serious injuries?—I believe there is no doubt of it. I do not know what evidence has been laid before the Commission, but speaking from my experience as a President of the Local Government Board, it has been within my knowledge that such cases have occurred. It has not been my business to make notes of the dates, places, and particulars; therefore, I should beg to refer the Commission for information on that subject to Dr. Buchanan.

12,846. The next point which you desire to mention to the Commission is the objectionable mode in which Public Vaccinators are now paid?—I have always objected to that. I objected to the system from the time I first joined the Poor Law Board as President in March 1871. I do not like it from an administrative point of view; I do not like the system of rewards and punishments administered by a central medical department. It seems to me to be one open to very serious objections. In the first place, I would remark that if medical men cannot be trusted to carry out so simple an operation as infant vaccination without inspection from a central medical board, and a system of rewards and punishments—a system of what you might call payment by results, to keep them to the proper fulfilment of their work, that is in itself an immense confession of the weakness of the case for compulsory vaccination. Here is one of the simplest operations which are known, and it is held to be necessary to have a supervision of the Public Vaccinators by a Government medical department looking into all the details of their work, looking after these vaccinators, seeing that their instruments are not dirty, and so on. The whole system is based, to my mind, upon the presumption of the unfitness of the very men who are appointed to fulfil the duties of Public Vaccinators.

12,847. Does it quite go to that length; the unfitness of a very few might work a great mischief, and human nature shows us, and we know it, that a certain number of men will probably be careless?—I must correct my expression and say the unfitness of a proportion of these men.

12,848. Therefore the ground taken might be that great injury might be done by the carelessness of a few, and that a certain per-centage of carelessness is probable where a large number of people are employed?—Yes, that might be so.

12,849. You would hardly suggest, I suppose, the abolition of any sort of supervision?—Certainly not; my expression was not a correct one, and what I would say to supplement it is this: that the system is not a system entirely worked by Public Vaccinators; you must take the system as a whole, and I am dealing with the system as a whole. I make the statement which I have just made as illustrating my view that there exists a medical opinion at head quarters that you cannot trust this system of compulsory vaccination in the hands of the medical profession without this supervision. As this supervision cannot be of itself perfect, and as it is not applied to every medical man who vaccinates, there is a clear and inevitable imperfection in the system.

12,850. What remedy would you suggest for that difficulty?—It is very much easier to find fault than to suggest remedies; but I have always thought that it would be a great advantage to decentralize and to decrease the area of the supervision. I think if instead of having the present system, of which the Commission is perfectly informed, you were to have a county system,



you would then have county opinion brought to bear upon this subject; you would have county professional opinion brought to bear upon it, and you would have greater personal knowledge of the members of the profession employed in vaccinating, on the part of those who had to supervise them, than can exist in conducting all these operations from the centre.

12,851. So that you would localise your districts and your system of inspection rather than carry it out by means of inspectors proceeding from the Local Government Board?—I would distinctly propose that the system of supervision should be conducted by the medical officers of health of the county councils, leaving it to be considered what should be the relationship between those medical officers of the county council and the medical department of the Local Government Board. I think their supervision would be more effectual. I think at present it seems rather like an attempt at the system of payment by results which has been exploded of late so far as regards the Education Department; and which I do not think answers very well here. The inspectors of the Local Government Board make triennial visits; they see the performance of the operation, and they inspect the instruments—they may find them dirty; they may have been dirty any time during the last three years; they judge of the fulfilment of the duty, as well as they can, and they withhold the reward if they think it is a case for withholding it. I do not know to what extent it is withheld; no doubt that is before the Commission; I assume that the Government reward is appropriated to the Public Vaccinators in the considerable majority of cases, but that the minority is a sensible minority of persons who do not earn it, who are therefore admittedly unfit.

12,852. Have you concluded what you wish to say upon that head?—I should wish to add that I do not like the shape in which this money is awarded, it being a kind of premium upon the performance of a duty. I would, in the interests of vaccination, think it perfectly legitimate to pay, whoever performed it, sufficiently to make it worth his while to be careful, and then I think there would be a right to look after him to see that he was careful; I should prefer that method to what I call the present method of payment by results, and the method of reward and punishment. It is said that Public Vaccinators are more efficient than private vaccinators, and according to Dr. Barry's experience at Sheffield (no doubt that evidence is before the Commission), that would appear to be the case; but if that is the case that itself is an argument against the present system, because it weakens the case for compulsory vaccination; it proves that it is at present unreliable and inefficient to a considerable extent, because those who are not Public Vaccinators are admittedly—or it is asserted that they are—less accurate and less reliable than the Public Vaccinator himself. Just as you ought, it may be said, to make infant vaccination compulsory by taking the child and vaccinating it, and as you ought to make re-vaccination compulsory for the same reason, so you ought to have vaccination invariably performed by Public Vaccinators, because the evidence of the system as now performed is that private vaccinators are comparatively unreliable and inefficient.

12,853. That would point to not accepting a certificate of vaccination except from a Public Vaccinator?—It would; and it is a weakness in the armour of the theory of compulsory vaccination. I am not aware that I have anything more to say on that point, except that I should like to remark that in my constituency of Halifax the subject of vaccination has excited considerable interest from time to time—not always; in fact it is rather apparently a characteristic of that anti-vaccination movement, that it, no doubt basing itself upon local incidents, is somewhat fitful in its explosions; but I have not presented myself here or offered myself for examination in consequence of any request on the part of my constituents; I was asked to attend here by certain gentlemen who are interested in this subject, upon what I believe is called the anti-vaccination side; and it appeared to me as an ex-president of the Local Government Board, that it was my duty to assent to that request.

12,854. (Sir William Savory.) You referred just now to the fact that it is generally allowed that infant vaccination is not protective throughout life, and that re-vaccination was a necessity; you were referring, I presume, to vaccination as a preventive of small-pox?—Yes.

12,855. And not to vaccination as modifying or mitigating the attack when it occurred?—Not at all; simply as a preventive.

12,856. (Mr. Meadows White.) Have you formed any definite idea of the effect which what you called moderate compulsion would have upon persuading parents to bring their children to be vaccinated?—It would be too much to say that I have formed a definite idea. I have arrived at an impression, which can hardly be called an idea, that more can be done upon that line than upon the present line, for the reasons I have endeavoured to show.

12,857. You think that if the compulsion were limited to the infliction of one fine, that would have an equal effect with the present system, in producing a universality of vaccination, or tending that way?—I should not like to assent to that as a definite proposition. Under legislation somewhat upon the lines of Mr. Forster's Bill, coupled with what I should propose in the way of decentralization of primary supervision; dealing with the matter in counties; interesting county public opinion more; interesting county professional opinion more, and with certain other practical modifications to which I have referred, I think that quite as much compliance with the law could then be expected as now.

12,858. I suppose, assuming vaccination to have the advantages claimed for it, the nearer you can get to universal vaccination the better?—No, that is too absolute a proposition for me to assent to; you might get somewhat nearer to universal vaccination at too great a cost. You might make the attempt, and you might succeed for a short time; the success might not be an enduring success.

12,859. Have you, with your great experience on this subject, considered what is the effect of compulsion in this sense: that if the fine is not paid, there is the prison in prospect; that is one feature of the present system?—Undoubtedly.

12,860. Although that may harden some conscientious persons, yet has it not a very great effect in inducing people to bring their children to be vaccinated?—But that effect is a dangerous instrument for the law to use; it makes martyrs; it makes opponents; and if you put that question to me, you must permit me to enlarge my reply, and to say (I hold a very strong opinion upon this subject) that with regard to all questions of this kind the legislature is too prone to the enactment of penal laws; they do not take sufficiently into account the possibility of education by legislation. I think it is better to take the trouble of reasoning with people, and making the thing less unacceptable to them, than simply to adopt at once, without any endeavour to find a *via media*, the commonplace alternative of fine or imprisonment.

12,861. I suppose you do not think the objection so strong to a simple fine?—I have not said what I think definitely the *via media* should be. I do not want to restrict myself. All I said was that I should prefer to see something more or less on the lines of Mr. Forster's Bill, with a view of securing the maximum of compliance and the minimum of opposition. Even if the present system produced for the moment a greater compliance, it does not follow that you would do more for the system of vaccination, if it be a right system, than if you dealt with the matter so as to educate the public mind into regarding it impartially, to say the least.

12,862. (Mr. Picton.) You spoke about the inequality in the operation of the vaccination laws as a local inequality; have you observed whether there is not also a social inequality, that is to say, a difference in the conduct of local authorities towards people in different grades of society?—Undoubtedly.

12,863. That is to say, that the poor are more likely to be rigorously prosecuted than the rich?—I admit that without the slightest hesitation or doubt. I have known cases of Members of Parliament who refused to vaccinate their children, and were not compelled to.

12,864. You said that if vaccination was to be thoroughly a preventive to small-pox, it would be necessary to have adult vaccination or re-vaccination; and as you added to that that it was impossible to contemplate a law of compulsory adult vaccination, will you tell us why?—It would not be submitted to undoubtedly.

12,865. You think there is a difference in the operation of the system as regards young children—that people are more ready to have their children submitted to the operation than to submit to it themselves?—I am afraid it must be admitted that they are.

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12,866. You told the Commission also that when you were President of the Local Government Board, you knew of cases of injury through vaccination which were reported?—Yes.

12,867. In any of those cases, were the medical officers of the department satisfied that such injuries had been produced by vaccination?—I think I may say I know that. Will you allow me to make an addition to that statement. That is my impression of the state of mind of the members of the medical department upon a subject of that kind in one or two cases within my recollection; but of course it would simply amount officially to the opinion that they were cases which ought to be further inquired into.

12,868. It is the practice always to make inquiry into such cases, is it not?—Yes; but cases might arise where they ought to be inquired into by a court of law.

12,869. Would you kindly tell the Commission the dates when you were President of the Local Government Board?—I was the first President of the Local Government Board. I became President of the Poor Law Board in March 1871. Then I passed the Act constituting the Local Government Board, and was its first President until February 1874—the end of that administration, and again for a very short time quite recently.

12,870. Of course there is a very strong opinion amongst the medical officers of the Local Government Board as to the absolute necessity for vaccination?—Clearly.

12,871. Does not that naturally make them unwilling to see any probability of injury arising from vaccination?—I would not say that of the expert medical officers of the medical department of the Local Government Board, who are extremely able experts, and very much accustomed to conduct inquiries of this kind. I think that a case of that kind would apply in this sense: supposing a child died, possibly from vaccination, and that certificate of the cause of death were given by the medical man who vaccinated it, I think there would be a natural tendency in his mind to believe that vaccination was not the real cause: I do not think that that would apply to the medical inspector of the Local Government Board.

12,872. You think that he has quite an open mind upon the subject?—I do not know that we have any of us quite open minds upon any subject, but I think he is trained to make those inquiries; and certainly they are admirable reports upon the whole which are made by those medical officers.

12,873. It would be doing a service, perhaps, if you would explain further what your idea is of the "inquiry" "by a court of law," which, you think there ought to be?—It would be a case of manslaughter. If an infant dies from careless vaccination that is manslaughter.

12,874. Would you confine the inquiry to cases of death entirely?—Certainly not.

12,875. Would you have an inquiry in case the child was injured?—What I was referring to was this: it is within my own knowledge or recollection (I should think the last year I was at the Local Government Board), that the medical department had very serious doubts in their mind in cases of death following vaccination, whether there ought not to be a legal inquiry into the cause of death.

12,876. That is to say, an inquest?—Yes, possibly an inquest.

12,877. But I understood you to be dissatisfied with the present mode of inquiry, and to add that there ought to be a legal inquiry into any of those cases; I thought you had in mind some other way of dealing with them than by an inquest?—If so, I gave an incorrect impression. I did not mean it. I made that statement, I think, in answer to a question as to whether anything had come to my knowledge with regard to the cases which the medical department thought very serious in their character; there certainly have been such cases.

12,878. And in such cases, without any legal inquiry?—Yes.

12,879. You have had an opportunity of observing how far sanitation is a preventive to small-pox, have you not?—There is the case of Leicester. We are told that there is to be a great visitation of small-pox some time at Leicester; it has not yet come.

12,880. You do not wish to express any opinion as to the effect of sanitation?—I think I could express some opinion. I do not think I am presuming too much in saying that great attention to sanitation, and to the general conditions of health, is calculated to diminish small-pox in the absence of vaccination.

12,881. (Dr. Collins.) I understood you to say, at the commencement of your evidence, that taking into consideration the strength of medical opinion in favour of vaccination, you thought some case was made out for a moderate compulsion?—Yes.

12,882. Would you, in your mind, proportionate those two factors at all: the strength of medical opinion in favour of vaccination, and the degree of compulsion which you would recommend?—No, I do not think I should like to do that. If I understand the question, I should judge of the amount of compulsion by reference to the effects which it would probably produce.

12,883. If the strength of medical opinion were less, would you consider the case for moderate compulsion less?—Yes, if the strength of medical opinion were much less, undoubtedly it would affect the case even for moderate compulsion.

12,884. Do you think there has been a change of medical opinion since the Report of the Committee of 1871, upon which Mr. Forster's recommendation was based?—I could not express any opinion upon that.

12,885. That report quoted with approval the opinion of Dr. West, that "he did not think vaccination did produce disease." Do I understand, from your experience at the Local Government Board, that you have no doubt whatever that injury and death result from vaccination as now practised?—I have no doubt that they have resulted.

12,886. As to the possibility of care preventing such occurrences, can you tell me whether there has ever been an action for *mala praxis* in the case of injuries arising from vaccination?—I do not know. I cannot answer that question.

12,887. Are you aware that one of the medical officers of the Local Government Board succeeded in inoculating himself with syphilis by vaccination?—I think I have heard so: at any rate I have heard of that being done.

12,888. Are you aware that Dr. Ballard, also one of the inspectors of the Local Government Board, has stated that there are numerous cases on record proving that syphilis and vaccine have been introduced into the body at the same time?—I cannot speak exactly upon that point. If the evidence of Dr. Ballard is before the Commission, of course I accept his statement.

12,889. Have you been able to form an opinion yourself as to the communicability of syphilis by vaccination?—I have not thought it my business to attempt to form what I may call a professional opinion, because it could not be of any value.

12,890. Are you aware that the Registrar-General returns every year some 40 or 50 deaths in England and Wales, certified by medical practitioners to be due to cow-pox and other effects of vaccination?—A certain number; I do not know the exact number.

12,891. Do you happen to remember an inquiry held under your Board in 1882 into certain injuries and deaths arising from vaccination at Norwich?—I remember that there was an inquiry of that kind. That was not, however, in my time.

12,892. The conclusion, I notice, at which the inspector arrived was this: "that the outbreak was due to some contamination of the lymph, which had escaped detection"; do you think, as far as you can judge, that all cases of injury and death arising from vaccination could be certainly avoided by care?—I could not undertake to give an opinion upon such a subject.

12,893. Do you think that it would be correct to say, "that the alleged injury arising from vaccination is indeed disproved by all medical experience"?—I do not know what the "alleged injury" there referred to is.

12,894. I wish to ask your attention to this paragraph. I am reading from a pamphlet entitled, "Facts concerning Vaccination for heads of families. Revised by the Local Government Board, and issued with their sanction." "The fear that a foul disease may be implanted by vaccination is an unfounded one. Such mischief could only happen through the most gross and culpable carelessness on the part of the vaccinator;



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"and as all medical men now receive special training in vaccination, no risk of this kind need be at all apprehended. Of course, vaccination, like anything else, requires a reasonable amount of care in its performance. The alleged injury arising from vaccination is indeed disproved by all medical experience." So far as you are aware, is that a correct statement of the facts?—If I am asked, I must say that that expression is a stronger one than I could give assent to. My impression is that it remains true; that there may be acts of carelessness upon the part of vaccinators which would have those results.

12,895. Do you happen to know that it has been stated by such an authority as Professor Fournier that it is not possible certainly to prevent the communication of syphilis by arm-to-arm vaccination?—I have heard that statement, but I do not wish to express any opinion upon a medical question. I may make this statement, I think, which may perhaps be as much as I could say. I certainly am under the distinct and strong impression that there may still be cases of very gross carelessness upon the part of vaccinators, which are not prevented by the present system of supervision; I think that one hears of cases of that kind in the localities themselves from time to time. One does not always trust all the details of what one hears, but one hears enough to come under the impression that conditions of that kind will occur. I am obliged to put it in this way. I do not want to say this, but I fear I must, that no method of supervision will ensure that your Public Vaccinator is an invariably sober man; and who can trust a man who is not sober in the operation of vaccination, or the care of his instruments? I say there is distinct danger in that respect.

12,896. You are probably aware that in our Army and Navy re-vaccination has been very thoroughly carried out?—I know it has been more or less carried out.

12,897. In the pamphlet from which I have quoted, I see it is stated that "Our Army and Navy, the men of which are always re-vaccinated on their admission to the force, have, since the requirement of re-vaccination came into operation, been singularly free from small-pox; and official experience in England and abroad has shown that soldiers who have been re-vaccinated can live in cities intensely affected by small-pox without themselves suffering to any appreciable degree from the disease." Do you think a statement as strong as that is warranted, when we find by the evidence before us that during the year 1888 there were 140 cases of small-pox in the British Army, with 15 deaths; that in 1883 there were 126 cases, with 12 deaths; and that in 1884 there were 114 cases with 9 deaths?—That would seem to show that compulsory re-vaccination is not a perfect security.

12,898. The Commission have received from the Local Government Board a list of allegations of injury following vaccination, which have been brought to their notice from the 1st of November, 1888, up to the end of last year, making a total of 153; do you happen to know whether in your time at the Local Government Board similar records were kept?—I cannot at this moment answer the question. You would obtain that information better from the department itself. It would be a mere matter of memory on my part.

12,899. (*Sir Charles Dalrymple.*) If there were only what you call moderate compulsion, would not that be sanctioning a system by which the public protection would be lost?—No, I only suggest considering the question whether an alternative method may not be adopted which shall not be open to the objections which I have made to the present system, and which will be practically quite as efficient.

12,900. Could you say what your impression is founded on that the opposition to vaccination is on the increase?—I said that that was my impression; but you must not take my evidence upon that as of any value. That is the impression I have received from what I have heard from time to time.

12,901. You said that it would be impossible to enforce a law of compulsory adult vaccination; is not that the case in America and Germany?—I am not sufficiently familiar with the laws of Germany to answer that

question; but I am perfectly convinced in my own mind that it would not be submitted to in this country.

12,902. What would be the use of a single penalty if it were known that no subsequent penalty was to follow?—I have not said that I was in favour of a single penalty. From the first I declined to commit myself to details, but I go upon the grounds of Mr. Forster's Bill. I seek what I call the *via media* of a moderate compulsion. I admit the argument against moderate compulsion; but against that I put the deficiencies of the present system, which I submit is not a system with complete and effective compulsion.

12,903. The honourable Member for Leicester raised the question of the unequal enforcement of the laws amongst different classes; when you were aware in your official experience that the law had been applied unequally as between the different classes, did you order any inquiry to be made?—I did not become aware of it in the course of my official experience. I was aware of it before my official experience.

12,904. Did any case of that kind occur during the course of your official experience?—No cases were brought to my notice.

12,905. (*Chairman.*) The Local Government Board itself never prosecutes?—No, the Board does not prosecute.

12,906. And if the Boards of Guardians do not prosecute, there is no prosecution?—No, it is the Guardians who prosecute, certainly.

12,907. (*Sir Charles Dalrymple.*) If cases of that kind came within the knowledge of the Local Government Board, would the Local Government Board have no power to take any steps?—No, I think the Local Government Board have no power to take any steps; it is committed to the Boards of Guardians to put the law in force. The Local Government Board might put pressure upon the Guardians, and they have from time to time sent letters to the Guardians pointing out to them the lines they ought to adopt.

12,908. (*Chairman.*) If the Boards of Guardians have not always followed the directions of the Local Government Board, because they have not gone so far in the way of enforcing compliance as the Local Government Board suggested that they should, at other times they have gone further, have they not?—Yes; the view of the Board has been that there should be tact and moderation, in the enforcement of the law; in fact, that there should be a moderate compulsion, even under the existing law, but that has not been the view of every Board of Guardians.

12,909. Do you think it would be possible or expedient to alter the body upon whom is cast the duty of prosecuting, so that it should not depend so much upon the opinion of the locality; because if in any district they entertain hostility to vaccination then they probably elect Guardians who would not enforce the law; would you think it expedient or possible in such a case where the Guardians to whom the enforcement of the law is committed declined to enforce it, to transfer the duty or authority to some other body?—I think it would be highly undesirable to transfer it to a Government department; I should be very sorry to be the head of such a department.

12,910. (*Mr. Meadows White.*) Or to the police?—I think that would be very objectionable. It would be certain to make it increasingly unpopular.

12,911. (*Chairman.*) You do not suggest any such remedy for the differing action of the various local authorities as taking the duty and the power away from the local authorities?—No, but I think if you adopted the view which I have suggested of moderate compulsion, you would very much reduce that inequality, and you would find that the objections of the Boards of Guardians would almost entirely vanish.

12,912. Do you think that those Boards of Guardians who are now elected upon the anti-vaccination cry would enforce vaccination even by moderate compulsion; that they would prosecute even for the single penalty, or whatever the moderate compulsion amounted to?—I think the cases where they would refuse to do so would be very much reduced.

The witness withdrew.



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Mr. CHARLES HENRY HOPWOOD, Q.C., examined.

12,913. (*Chairman.*) You were formerly Member of Parliament for Stockport?—I was.

12,914. And you are now one of Her Majesty's Counsel, and Recorder of Liverpool?—I am.

12,915. You have, I believe, taken for many years considerable interest in the subject of vaccination?—I have.

12,916. I believe whilst you were in the House of Commons you called attention from time to time to various questions which arose in the administration of the vaccination laws?—I did so on many occasions.

12,917. I believe you are desirous of bringing before the Commission an account of the Acts which have been passed and the Bills which have been introduced relating to vaccination?—I desire to do so with the permission of the Commissioners.

12,918. Will you proceed with your statement?—I propose to give the Acts in the order in which I have found them on the Statute Book, interspersing between them such observations as I can support by reference to Hansard of the intention in the mind of the Legislature in passing the Acts. Of course I am well aware, as a lawyer, that once an Act is passed, to construe that Act we cannot refer to previous history; but before this Commission I apprehend that it would be pertinent to the inquiry to know what steps have been taken to go along with public opinion in the legislation which has been provided, because I apprehend that the inquiry here is whether an alteration shall be made in that legislation or not, and if so, upon what lines. The first Act making it lawful to pay for vaccination out of the rates was 3 & 4 Vict. c. 29. (1840), which after stating that "it is expedient to extend the practice of vaccination," enacted that "from and after the passing of the Act," that is July 23rd, 1840, "it shall be lawful for the Guardians of every parish or union, and for the overseers of every parish in which relief to the poor shall not be administered by Guardians, in England and Wales, and they are hereby directed to contract with the medical officers of their several unions or parishes respectively, or with any legally qualified medical practitioner or practitioners, for the vaccination of all persons resident in such unions or parishes respectively." Then the conditions of that contract are set out. The only section I would refer to is section 8 of that Act. I may add that the intermediate ones all refer to the Guardians, and so on. Section 8 says: "That any person who shall from and after the passing of this Act produce or attempt to produce in any person, by inoculation with variolous matter, or by wilful exposure to variolous matter, or to any matter, article, or thing impregnated with variolous matter, or wilfully by any other means whatsoever produce the disease of small-pox in any person in England, Wales, or Ireland, shall be liable to be proceeded against and convicted summarily before any two or more justices of the peace in petty sessions assembled, and for every such offence shall, upon conviction, be imprisoned in the common gaol or house of correction for any term not exceeding one month."

12,919. (*Mr. Meadows White.*) The condition of the contract was payment by results?—That was so. The first section says: "Provided always, that it shall be a condition of every such contract that the amount of the remuneration to be received under the same shall depend on the number of persons who, not having been previously successfully vaccinated shall be successfully vaccinated by such medical officers or practitioners respectively so contracting." Of course it will be noted that up to this time inoculation had been lawful. Then by a statute passed in the following year, 1841, 4 & 5 Vict. c. 32., it was enacted that the expenses of vaccination should be paid out of the poor rate (that was a point which had been overlooked in the Act of the previous year), and by section 2, "vaccination or surgical or medical assistance incident to the vaccination shall not be considered as parochial relief, alms, or charitable allowance," and should not deprive the recipient of it of any right or privilege, or subject him to any disability or disqualification whatsoever. Then following out the history of things, in 1850 the Epidemiological Society was formed, and that society prevailed on Lord Lyttelton to introduce into the House of Lords what

was called "The Vaccination Extension Bill." I refer to Hansard for what follows. It was read a second time on April 4th, 1853, after a few words of debate (see Hansard, vol. 125, page 518). On the motion to go into Committee (page 1002 of Hansard, vol. 125), Lord Lyttelton said: "It was unnecessary . . . to speak of the certainty of vaccination as a preventive of the small-pox, that being a point on which the whole medical profession had arrived at complete unanimity. For almost all his information he was indebted to some able and learned persons belonging to the Epidemiological Society, having no scientific knowledge of the subject himself." There was no adverse discussion. The Bill was read a third time on April the 18th. In the House of Commons Sir John Pakington (the reference is to Hansard, vol. 129, page 470) moved the second reading. He also based his support of the measure upon "the Report of the Vaccination Committee of the Epidemiological Society." Mr. Brady objected and said "it was not a compulsory measure that was required, but one which should meet the sympathies of the people, and which the people would assist in carrying out." Mr. Frewen (page 475 of Hansard, vol. 129) also objected. "They might have a medical man to vaccinate, but what security had they that the operation would be properly performed." The Bill was read a second time. There is no record in the Index to Hansard of its passing through Committee; at least, I have not been able to find it, but, I think, it must be assumed that it must have been *pro formâ*, although overlooked possibly as matter of record in Hansard, passed through the Committee in the usual way. It was read a third time without opposition. The Act, which is 16 & 17 Vict. c. 100, by section 2, required the father or mother of every child born after August 1853 to take it to be vaccinated within three months of birth, and other persons having the care or custody of children within four months of birth to take them to be vaccinated. By section 2 the child is "to be taken to the medical officer or practitioner appointed." By section 6 the fee for vaccination is fixed at 1s. 6d. "for every person successfully vaccinated at the residence of the medical officer, or within two miles thereof," and "for every person successfully vaccinated at any place more than two miles distant from such residence not less than 2s. 6d." I would only just remark, to draw attention to it, that it is a matter of complaint that mothers have to take their children long distances twice in all weathers and bring them back twice. That is necessarily so, owing to the wide districts. The penalty for disobedience or for failure to bring the child up for inspection was forfeiture of "a sum not exceeding 20s." recoverable before two Justices, and to be applied in aid of the poor rate. In 1855 the Epidemiological Society presented a memorial to the President of the General Board of Health, which was ordered to be printed by the House of Commons on March 1st, 1855. I have that paper here; it may be as well to put it in evidence, or, at all events, such portions of it as I am about to read. It declared in paragraph 3: "Yet small-pox is the most preventible of diseases, differing from all other epidemic diseases in this remarkable respect that while these latter can only be prevented by discovering and remedying the various conditions (as of crowding, want of drainage, filth, and the like) which give rise to or assist in the dissemination of the specific poison of each disease, the former may be guarded against and prevented by a direct prophylactic measure. To small-pox, in short, there is an antidote. The same cannot be affirmed, in the present state of our knowledge, of any other epidemic disease." Then paragraph 4 says: "That antidote is vaccination. In exact proportion as this has been efficiently practised, have the extent and severity of small-pox been diminished over the surface of the world; to the neglect of it, or to its inefficient performance is due the still large existing mortality in this country,—a mortality in striking contrast to that which obtains in some other countries, in which more adequate provision is made for the vaccination of the people. While out of 1,000 deaths from all causes, there are, in England and Wales, 21 from small-pox, and in some parts of Ireland upwards of 50, in Sweden, Bohemia, and some of the Italian States, there are not more than two." Of course, I read these not as



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adopting what is stated upon them, but as showing the contention upon which the measures for compulsion were more or less based and pressed upon Parliament from time to time. Some of these statements probably, would now be challenged and not even defended. The 5th paragraph runs: "The Small-pox and Vaccination Committee of the Epidemiological Society, in a 'Report on the state of Small-pox and Vaccination' in England and Wales, and in other countries,' of which a copy is herewith enclosed, have thoroughly investigated the methods pursued in various countries of Europe for the vaccination of the people, with their results, and have arrived at the conclusion, that two things are essential to the thorough vaccination of any population; videlicet, 1st. That it be made a matter of legal obligation. 2nd. That there be added administrative science, zeal, and activity."

Paragraph 6 is as follows: "The union of both these conditions is indispensable; either of them, without the other, will fail." Then in paragraph 7 of the paper, towards the end of it, it runs thus: "Thus, one of the two grand requisites pointed out for the vaccination of the people, videlicet, the rendering it a matter of legal obligation, was at length adopted" (speaking of England and Wales), "but not, as we shall immediately proceed to show, to the full extent required, while no provision whatever was made for the application of that administrative science, zeal, and activity, which, it has been already stated, are equally essential with a legislative enactment for the attainment of the object desired." Then the next paragraph I refer to in this paper is No. 10—there is a sub-division in Roman characters (A) headed, "Deficiencies in the Compulsory Act." "The compulsory Act applies only to children born in England and Wales after a certain date; it does not extend to the whole existing population of England and Wales, nor to those who, whether adults or children, may at any time immigrate into this portion of the kingdom. This is a grave defect. It is well known that small-pox is largely imported into this country, and kept up by immigrants from Ireland, and this to such an extent that it has been made a matter of complaint from towns in the north of England to the Poor Law Board. These Irish immigrants not only form a *nidus* for the disease in towns in which they collect in large numbers, as London, Liverpool, Glasgow, Bristol, &c., &c., but they disseminate it throughout the country, as at harvest time and in the season of hopping." Then the following paragraph (B) says: "The Act professes to punish disobedience by fine or imprisonment, yet there is no one specially charged with its execution; no public officer of any kind whose duty it is to proceed against offenders; a defect repeatedly alluded to by the district registrars throughout the country." Then I would refer to the paragraph marked (C.) under the second heading, "Defects in the System of Administration": "The present system has been faulty in this respect, that the provisions for the remuneration of Public Vaccinators have not been such as to secure their hearty and zealous co-operation. The most injurious consequences have undoubtedly resulted from this, both in limiting the numbers vaccinated and in discouraging the Vaccinators from giving that pains and attention to watch the progress of the vaccine disease which are imperatively necessary, a point to which further allusion will be made hereafter." The next paragraph (D) runs thus: "But no enactment, however comprehensive and stringent; no alteration in the mode of appointing Public Vaccinators, however desirable; no additional remuneration and encouragement to them, however necessary, will be sufficient to secure the grand object to be had in view, the universal diffusion of vaccination and the extinction of small-pox, unless there be some competent and energetic medical officer to harmonise the whole system and keep it in constant activity; to examine continually its working, that what is defective may be immediately supplied, and, in cases in which it is required, to enforce the law whether against those who refuse to submit to the vaccination, or against those who, by travelling about and improperly exposing themselves, notwithstanding the stringent penal enactments which exist to the contrary, diffuse small-pox throughout the kingdom." Then the next I would refer to is a sub-division of this same paragraph (D.) that I am reading now. (D.) is in Roman letters and (g) in the small italics. About the middle of the paragraph I find this: "The possibility of keeping small-pox altogether out of a district by thorough

vaccination has been demonstrated in the report of the Epidemiological Society, and it is only by such a step as that now suggested that it will even be possible to prevent epidemics of small-pox." I am sorry to say that I have not seen that Report of the Epidemiological Society, and I should feel some incredulity that it has been demonstrated that small-pox could be kept "altogether out of a district by thorough vaccination." Then I proceed with (h) in italics, which is as follows: "It would also be his (the Central Superintendent's) special duty in like manner to see that proper provision was made for the vaccination of all unvaccinated immigrants, and he would endeavour eventually to secure such an extension of a good plan of vaccination to Scotland and Ireland as would abolish much of the risk now run by the inhabitants of that portion of the kingdom from persons immigrating thence." Then (l.) in italics: "In concert with the National Vaccine Establishment he would see that the Vaccinators were duly supplied with good and effective lymph." Then we come to paragraph 11, and about the third line in the paragraph it says this: "That it be a matter of legal obligation on all persons resident within England and Wales, whether born in that portion of the kingdom or not, to give evidence of being vaccinated; that a better system of registration be established; that the administration of public vaccinations be transferred from the Poor Law Board to the Board of Health; and that there be one or more medical superintendents under that Board, a general outline of whose duties has already been given. The fundamental changes being provided for by Act of Parliament, the details of administration would be directed by the Minister of Health, subject to the control of the Secretary of State." I have read, I think, sufficiently from that. There is much more that I have not read, but I have read, I think, enough to show what the demands of that society were, and the assertions upon which they demanded that those suggestions should be carried out. Then a Bill was drafted upon the lines of that report; I think that fact will be proved by a comparison of the one with the other. That Bill was read a first time on July 16th, 1855.

12,920. (Chairman.) Was it introduced by a private Member or by a Government Department?—I think it was brought in by private Members, Mr. Brady, and an old friend, Mr. Montagu Chambers, Q.C., of our body. This Bill proposed that, from the 1st day of January 1856, the public vaccinations in England and Wales should be placed under the control of the General Board of Health. That is a suggestion which has been repeatedly made, with the view to bringing them more directly under competent medical control, as I presume, instead of leaving them under elective bodies such as Guardians. They "shall be under the immediate direction and management of a medical superintendent of public vaccinations, to be appointed by the Board, at a salary to be arranged with the Treasury." Then by section 4 of the Bill: "The General Board of Health shall have the power of appointing medical inspectors, whenever the medical superintendent shall report to them that it is expedient so to do, for the purpose of ascertaining the state of vaccination in England and Wales or in any part thereof, and of carrying out any directions which may be given them by the medical superintendent of public vaccinations for the more effectual working of this present Act; and the said inspectors may be also inspectors for other purposes connected with the General Board of Health, and they shall be paid such salaries as the Board shall direct, together with reasonable travelling expenses." Then by section 5: "The General Board of Health shall have the power of appointing any legally qualified medical practitioner to be a Public Vaccinator; and all practitioners so appointed shall observe all the regulations respecting vaccination which may be issued by the General Board of Health, or by the medical superintendent of public vaccinations in the name of the Board, and in default thereof their appointment may be cancelled." Then I pass on to section 8 of the proposed Bill, and that is in terms thus: "Every adult person residing in England and Wales on the first day of January one thousand eight hundred and fifty-six, who shall not already have been successfully vaccinated nor had the small-pox shall, within three months of the said first day of January one thousand eight hundred and fifty-six, cause himself to be vaccinated by some duly qualified medical practitioner or by a Public Vaccinator, and shall, on the eighth day, from and in-



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cluding the day on which he has been so vaccinated, cause himself to be inspected by the medical practitioner or Public Vaccinator by whom the operation was performed, or by some duly qualified medical practitioner acting on his behalf, in order that the result of such operation may be ascertained and registered; and in default thereof he shall be liable to a penalty not exceeding twenty shillings." Then section 9 ran thus: "Every adult person who after the first day of January one thousand eight hundred and fifty-six shall come to reside in any part of England and Wales, and who shall not already have been successfully vaccinated nor had small-pox, shall, within three months of his arrival, cause himself to be vaccinated by some duly qualified medical practitioner or by a Public Vaccinator, and shall, on the eighth day from and including the day on which he has been so vaccinated, cause himself to be inspected by the medical practitioner or Public Vaccinator by whom the operation was performed, or by some duly qualified medical practitioner acting on his behalf, in order that the result of such operation may be ascertained and registered, and in default thereof he shall be liable to a penalty not exceeding twenty shillings." Then section 10 proceeds thus: "The father or mother of every child resident in England and Wales on the first day of January one thousand eight hundred and fifty-six who shall not already have been successfully vaccinated nor had small-pox, or in the event of the death, illness, absence, or inability of the father and mother, then the person who shall have the care, nurture, or custody of the said child, shall within three calendar months from the said first day of January one thousand eight hundred and fifty-six, take or cause to be taken the said child to some duly qualified medical practitioner, or to a Public Vaccinator, for the purpose of being vaccinated." There is nothing special in that; what I read it for is to show that the proposal was that every child resident (not born) in England shall be liable to this. The penalty there is the same, namely, 20s. Then I pass on to the clause which provides for the recovery of penalties, Clause 21, which is: "Whenever it shall appear to the medical superintendent of public vaccinations that vaccination is not properly carried out in any district, he shall immediately institute an inquiry, either by himself or by one of the medical inspectors of the Board of Health duly appointed for the purpose, as provided in clause four, into the causes thereof; and for the purposes of this inquiry he shall be entitled to require of the sub-registrar of the district a list of the names and places of abode of all children whose births have been registered within a period to be by him specified; and whenever he shall deem it necessary he is hereby empowered and required to proceed for the recovery of penalties against any person offending against the provisions of this Act, before any two Justices of the Peace for the county, city, borough, or place where the offence may have been committed, and no proceeding for penalties under this Act shall be instituted against any person but by the said medical superintendent of public vaccinations, or by an inspector or other person duly authorised to act on his behalf; and any penalties recovered under this Act shall be applied to —." What they were to be applied to has not been supplied in the copy printed for the House. The Bill, to give the reference to it, is Bill No. 252 for 1855. This Bill was withdrawn without discussion. I rather think Mr. Brady was, if I remember rightly, a member of the medical profession, and he advocated this matter. I am not sure whether he was not also a member of the Epidemiological Society; at all events the Commission will probably take it that the lines of the Bill I have read are very closely following upon the memorial of the Epidemiological Society. Then on the 7th of March 1856, a Bill to consolidate and amend the law relating to vaccination was printed; it was brought in by Mr. Cowper, afterwards Mr. Cowper-Temple, and Mr. Bouverie. That Bill defined "child" as including every person up to the age of 13 years, which will be important when we come to consider the terms of a later statute. Section 8 allowed vaccination at residence during the winter months. Section 11 re-enacted section 2 of the Act of 1853, and section 16 required the parent or guardian of every child in England which had not been successfully vaccinated or had the small-pox to have it vaccinated. Section 17 raised the fees to 2s. 6d. and 3s. 6d. respectively. Section 20, subsection C., required the overseers or Guardians to proceed for the recovery

of the penalties imposed. These were very severe. Section 29 was as follows: "The parent or guardian of any child born since the twentieth day of August one thousand eight hundred and fifty-three, not having caused such child to be vaccinated, or not having procured a certificate of insusceptibility to vaccine disease, in the manner provided by the law in force in the place of residence of such parent or guardian, at the time of the birth of such child, shall be liable to a penalty not exceeding twenty shillings. Every person refusing or neglecting to comply with any requirement of this Act shall be liable to a penalty not exceeding twenty shillings, and in the case of a continuing refusal or neglect, to a penalty not exceeding five shillings for every day during which such neglect shall be continued from and after the receipt of any notice from the Guardians or overseers under the provisions of this Act." That clause was afterwards amended in Committee, and when the Bill was reprinted upon the 3rd of July, it appeared in the following form, as clause 20: "The parent or guardian of any child born since the twentieth day of August one thousand eight hundred and fifty-three, not having caused such child to be vaccinated, or not having procured a certificate of insusceptibility to vaccine disease, in the manner provided by the law in force in the place of residence of such parent or guardian, at the time of the birth of such child, and every person refusing or neglecting to comply with any requirement of this Act, shall be liable to a penalty not exceeding twenty shillings." The second reading of the Bill was moved in the House of Commons on March 31st, 1856, by Mr. Cowper, the then Secretary or President of the Board of Health. The reference to Hansard is volume 141, page 271. He said: "It was admitted by every medical man whose opinion was worth a moment's consideration that vaccination was a specific against small-pox, of course he meant where that operation was properly performed. In fact it was a point decided in the medical world that vaccination when properly performed was a guarantee against small-pox except in extremely rare cases, and no evidence could be produced to justify the idea that it produced injurious consequences." Then he is followed in the short debate which took place, by Mr. Barrow, who said: The Right Honourable gentleman said that compulsory clauses of the existing Act had never been objected to, but did he ever hear of a case in which anyone had ever attempted to inflict a penalty under its provisions." Then Mr. Henley, afterwards the Right Honourable J. W. Henley, opposed. He said: "There had certainly been a good deal of dissatisfaction throughout the country as to the mode in which vaccination had been performed. In his own neighbourhood, for example, the poor people complained that all sorts of eruptions had made their appearance upon their children after the forced vaccination they had had to undergo, and though this might have nothing to do with the vaccination the poor could not be persuaded —." I leave out what follows there; there is a little hiatus. He proceeds: "The present system of compelling mothers to leave their homes and take their children to the Vaccinator was a very inconvenient one, and some consideration should, he thought, be given to this point in consequence." The Bill was read a second time that night. It was amended in Committee, and reprinted on July 3rd, 1856. There was a new clause put in which caused the reprinting, that is section 20, which I have read. Then on July 7th, Mr. Thomas Duncombe asked when the Vaccination Bill would be brought on. He said (Hansard, vol. 143, page 402): "Two hundred petitions had been presented against it and only one in its favour, from the Royal Vaccine Establishment. A more arrant job than this Bill he never knew." Mr. Cowper said: "The purpose of the Bill was to consolidate and improve the law." He promised not to bring on the Bill after midnight. On July 10th it was withdrawn by Mr. Cowper, who said: (this is to be found in Hansard, vol. 143, page 549) "The present law was in such a state that it could not continue as it was." Public Vaccinators were appointed throughout the country, but there was no security that they should be skilful and competent to discharge their duties. There was no security provided that the lymph should be of a healthy character. The law imposed a penalty for non-vaccination, but there were no means of inflicting it; no one was called on to prosecute, and there was no fund out of which the expenses of prosecution could be defrayed. A Bill was introduced last year to



"transfer the administration of the law from the Guardians to the Board of Health. He opposed that; but as it was evident that the law must either be altered altogether or made efficient, he had introduced the present Bill. . . . He thought to secure more careful and skilful vaccination, by placing them under the superintendence of a body of medical men of eminence, and requiring a certificate of attendance at a small-pox hospital, and of skilful performance of the operation." Then comes a little matter which I do not consider it material to quote; and the extract proceeds: "There was another objection far more weighty. It was asserted that a great number of persons did not admit that vaccination was a proper, safe, or efficient measure of protection against the small-pox, and that certain disorders not merely followed, but were caused by vaccination. . . . It might be that there was something in the manner in which vaccination was performed among the poorer classes which prevented its being as safe and efficient a precaution as it was for the richer portion of the community. . . . Under these circumstances he adopted Mr. T. Duncombe's suggestion, and would move next session for a Select Committee 'to inquire into the manner in which vaccination was practically performed,' and would discharge the order for going into Committee." Mr. Duncombe said: "In 1853 a Compulsory Vaccination Bill was smuggled through the House. Fortunately it became inoperative by its own defects, and remained a dead letter." The Bill was accordingly discharged. No Select Committee was moved for in 1857, and none was held until, I think, the date of 1871, which has been, I daresay, already before the Commission. In 1857, however, a Bill was brought in by Mr. Duncombe to repeal the Act of 1853, read a first time, and abandoned. I have that Bill here. This is a Bill ordered by the House of Commons to be printed upon the 11th of June 1857, brought in by Mr. Duncombe, Mr. Coningham, and Mr. Barrow. It is in very short terms: "Whereas an Act was passed in the seventeenth year of the reign of Her present Majesty, intitled 'An Act further to extend and make compulsory the practice of vaccination:' And whereas it is not expedient to enforce the provisions of the said Act: Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows: 1. The said herein-before recited Act shall be and the same is hereby repealed." Then on May 31st, 1858 (the reference is to Hansard, vol. 150, page 1196), in answer to Mr. Monsell, Mr. Adderley said (I believe Mr. Adderley was in office in a similar position to Mr. Cowper-Temple): "In several places one-third of all the deaths during the quarter had taken place from small-pox. He believed that this was owing both to bad vaccination and to neglect of vaccination. He was not prepared to make the penalties more stringent." Here I may observe that I think there will be traced through the course of legislation an unwillingness on the part of the House ever to pass more stringent penalties, and that that which has excited so much comment is the construction which has been put upon the Act of Parliament by a decision of a court of law, but it has never been expressly enacted by Parliament. Then in 1859, upon March 7th, Lord Granville called attention to vaccination. He said (Hansard, vol. 152, page 1341): "There was very little doubt that the increasing number of cases of small-pox was attributable to neglect of vaccination or to bad vaccination." Lord Redesdale said (page 1345): "There was no doubt that the regulations of the Act had been very much neglected. The Act had been almost inoperative." Lord Granville said: It was a pity that . . . I do not follow up the remark, but he goes on to say: "The practice remained in abeyance. If necessary, the Privy Council ought to have come to Parliament for more powers." In 1860 nothing took place. In 1861 the Vaccination Bill was read a first time on June 10th, and a second time on June 19th without debate.

12,921. (Mr. Meadows White.) I think you have omitted an Act of the 14th of June 1858, which had reference to vaccination upon a minor point of procedure?—I will make a note of it.

12,922. It is the 21st Victoria, chapter 25, section 7. I only mention that to show that the subject was before the House of Commons then; but it is a mere matter of procedure?—Then on the motion to go into Committee

on July 10th 1861, Mr. Duncombe moved to go into Committee that day three months. "The measure involved," he said (Hansard, vol. 164, page 673), "a breach of faith on the part of the Government, as two years ago they had agreed that there should be no compulsory legislation until after a parliamentary investigation into it had taken place." Mr. Lowe replied "that the Act of 1853 had fallen into desuetude, because it did not provide for the expenses of prosecution." The House at once went into Committee, and after some amendments the Bill passed through Committee, and was read a third time July the 12th. It passed all its stages in the Lords without debate, and became law as the 24 & 25 Vict. c. 59, "The Vaccination Acts Amendment Act, 1861." By section 2 of that Act it was provided that "The Guardians or overseers may appoint some person to institute and conduct proceedings for the purpose of enforcing obedience" to the Vaccination Acts, and the expenses, if allowed and ascertained by the Justices, were to be "payable out of the rates for the relief of the poor of the parish where the person for the time being dwells in respect of whose default or offence the same was instituted." And proceedings for enforcing penalties may be taken at any time during which the parent or guardian is in default. On June 18th, 1863 (Hansard, vol. 171, page 1037), Lord Lyttelton (who introduced the Act of 1853) asked "whether the Government intended to bring in an amending measure. The Act of Parliament which he had introduced, like much amateur legislation, was not perfect. . . . There had been some little further legislation, but there was still something wanting, for at this moment, in one or two of the smaller kingdoms of Europe, small-pox had been entirely eradicated by vaccination, a result which was far from being attained in this country. The Epidemiological Society, through their President, Dr. Babington, offered four suggestions for the amendment of the law, (1) Provision for systematic local supervision of vaccination; (2) More effectual means for enabling the local authority to ascertain who were and who were not vaccinated in their district; (3) Extension of the age within which vaccination must be performed in those districts where, from the limited supply, proper vaccination from the arm could not be maintained periodically; (4) Extension of powers of Privy Council over local arrangements as far as was necessary to secure more effectual supplies of fresh lymph. Earl Granville said the Government were alive to the importance of the subject, and the expediency of amending the law was under consideration." Then, on January 27th, 1864, the case of *Pilcher v. Stafford* (33 Law Journal, Magistrates' Cases, 113) was heard before the Court of Queen's Bench. I have that case here, which the noble Chairman will appreciate, and I cite it just to show the different dealing of the court with that section which they had there to deal with under this Act of Parliament and the later mode of dealing with the 31st section of the later Act, which has been so much commented upon. I have both cases here. In the case of *Pilcher v. Stafford* the head-note runs thus "The 16th and 17th Victoria, chapter 100, section 2, enacts that 'the father or mother of every child shall, within three calendar months of its birth, take it to the proper medical officer, unless previously vaccinated by some duly qualified practitioner; and by section 9, the registrar shall, on registration of the birth, give notice of this duty, and if after notice the parent shall not have the child vaccinated accordingly, he shall forfeit a penalty not exceeding 20s. By the 24th and 25th Vict. c. 59. s. 2, any proceedings for enforcing penalties on account of neglect to have a child vaccinated may be taken at any time during which the parent is in default.' The words of that section are: 'And proceedings for enforcing penalties under any of the said Acts on account of neglect to have a child vaccinated may be taken at any time during which the parent or guardian is in default.' It being, I think I may say, a rule of law that no man can be convicted twice for the same offence, it was contended on the one hand that this man having on the facts been convicted with regard to the same child before could not be convicted again. On the other hand it was argued that those words 'at any time' showed that the Legislature meant 'as often as,' *toties quoties*, and that was the point before the court on that occasion. An information was preferred by the appellant, R. Pilcher, Registrar of Births and Deaths, and the person appointed by the Guardians of the Isle of Thanet Union pursuant to the 24 & 25 Vict. c. 59,

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"to institute and conduct proceedings for the purpose of enforcing obedience to the Vaccination Acts within Margate, against W. G. Stafford, the respondent, under sections 2 and 9 of 16 & 17 Vict. c. 100., alleging that the respondent, on the 23rd of November 1863, at &c., then being the father of a certain child, called Albert Alfred Kennett Stafford, born after the 1st of August 1853, to wit, on the 16th of July 1862, unlawfully did not, within three calendar months after the birth of the said child, take or cause to be taken the said child (which had not been previously vaccinated by some duly qualified medical practitioner) to one of the medical officers, duly appointed in that behalf, in Margate aforesaid, for the purpose of being vaccinated according to the provisions of the said Act of the 16th and 17th Vict. c. 100, although one, Henry Wootton, the late Registrar of Births in Margate aforesaid, did, on the registration of the birth of the said child, to wit, on the 24th of July 1862, give due notice in writing to the said respondent, in manner and form directed by the said Act. At the hearing it was proved that proper notice had been given to the respondent, pursuant to the 9th section of the 16th and 17th Vict. c. 100.; that he had failed to comply therewith in not having the said child vaccinated within the three months allowed him for the purpose, in section 2 of the said Act; and the respondent admitted that the said child had not even at the time of such hearing been vaccinated. The respondent then stated, and the fact was admitted by the appellant, that he, the respondent, had already been previously convicted by certain Justices on the 18th of February 1863, upon a similar information laid by the appellant against him, for not having the said child vaccinated in compliance with the requirements of the statute, and that he was then fined, and subsequently paid, 2s. 6d. for penalty and 9s. 6d. for costs. He therefore contended that he could not again be punished for the same offence. In reply to this objection, the appellant referred to the concluding words of the 24th and 25th Vict. c. 59. s. 2, viz., 'And proceedings for enforcing penalties under any of the said Acts, on account of neglect to have a child vaccinated, may be taken at any time during which the parent or guardian is in default,' and submitted that it was the manifest intention of the legislature, by a series of Acts, to make vaccination compulsory, and that the words 'at any time' must be construed to mean that a parent so in default might be convicted again and again, until he obeyed the directions of the statute, and he produced an opinion, emanating from the Vaccination Department of the Privy Council, in support of his view. The Justices, however, formed a different opinion, and dismissed the information, the grounds of their determination being as follows: That the respondent having been previously convicted for the same offence, a second conviction could not take place, as the common law principle 'that no man ought to be twice punished for one and the same offence' must prevail, in the absence of any express legislative enactment to the contrary. That the words 'at any time' must be construed strictly, and are not sufficient to embrace the view contended for by the appellant, they appearing to the Justices to be directed to the object of preventing the limitation of six months for proceeding summarily (as prescribed by Jervis's Act, 11 & 12 Vict. c. 43, which is incorporated in the Vaccination Acts) commencing to run." Then follows the argument of counsel. No one appeared for the respondent, but it was argued for the appellant by Mr. Thompson, and the Chief Justice delivers this judgment: "I quite agree that the continuous omission to have a child vaccinated is as much within the mischief intended to be remedied by the statutes as the not doing it within the prescribed time; but this mischief has not been reached by the present legislation. The 2nd section of the 16th & 17th Vict. c. 100. imposes the duty of having a child vaccinated within three or four months of its birth, as the case may be; and the 9th section requires that the registrar shall give notice of this duty; and if the notice be given and the duty not performed within the prescribed time, then this non-performance is the offence arising and punishable under the Act; and when once that offence is complete and has been dealt with, and the person offending has been punished, no further offence can be committed. It is not enough to say the mischief continues the answer to that is, the Act does not enact a remedy. If we were to hold otherwise on the present enact-

ments, it would follow that for every day during which the omission to vaccinate a child continues, a penalty would be incurred, so that the penalties might accumulate to a very serious amount, which could never have been the intention of the legislature." Mr. Justice Blackburn and Mr. Justice Mellor concurred.

The next reference in the parliamentary history of the question is on March 4th, 1864, as appears by Hansard, vol. 173, page 1,475. "Mr. Baines asked 'if the Government intended to bring in a Bill to make the vaccination law more effectual?' (Mr. Lowe.) 'I am not aware of any such intention.'" Then [Hansard, vol. 175, page 779], on May 30th, 1864, Lord Lyttelton asked a similar question in the Lords, and the Earl of Shaftesbury backed it by reading an extract from the report of the Epidemiological Society. Earl Granville said: "There were only two ways of effecting the object. (1.) The adoption of more compulsory means. (2.) By higher payments. The Government had come to the conclusion that the first alternative was not desirable and he believed this was also the opinion of the Epidemiological Society. There was hardly sufficient information to justify the Government in paying more of the public money without further inquiry. He suggested that Lord Lyttelton should bring in a Bill and that it should be referred to a Select Committee of the House." On June 13th, 1864, a similar question was put by Sir John Pakington to Mr. H. A. Bruce and a similar answer given. In 1865 no Bill was brought in and no Select Committee was moved for. In fact there was no question asked on the subject. On February 22nd, 1866, a Bill "To Consolidate and Amend the Statutes relating to Vaccination in England" was brought in by Mr. H. A. Bruce and Mr. Baring and read a first time. On March 8th it was read a second time, without debate. That is Bill No. 33, and section 15 of that Bill makes it the duty of the parent or other person to procure the vaccination of the child within certain periods. I do not know of any difference being made by that section, so I do not read it. Then the first of the clauses as to penalties is the 27th, which is: "Every parent or person having the custody of a child who shall neglect to take such child or cause it to be taken to be vaccinated, or after vaccination to be inspected or re-vaccinated and re-inspected, according to the provisions of this Act, shall be guilty of an offence, and be liable to be proceeded against summarily, and upon conviction to pay a penalty not exceeding twenty shillings." Then we come to the now celebrated clause, the 29th: "If any registrar, or any officer appointed by the Guardians to enforce the provisions of this Act, shall inform a Justice of the Peace that he has reason to believe that any child under the age of thirteen years, being within the union or parish for which the informant acts, has not been vaccinated, the said Justice may summon the parent or person having the custody of such child to appear with the child before him at a certain time and place, and upon such appearance, if the Justice shall find that the child shall not have been successfully vaccinated, he may, if he see fit, make an order under his hand and seal, directing such child to be vaccinated within a certain time, and if at the expiration of such time the child shall not have been so vaccinated, and shall not be shown to be then unfit to be vaccinated, or to be insusceptible of vaccination, the person upon whom such order shall have been made shall be proceeded against summarily, and shall be liable to a penalty not exceeding twenty shillings; and it shall be no answer to the making of such order that the person upon whom it shall be proposed to make it shall have been previously convicted of an offence under this or any other Act relating to vaccination." It will be seen by the Commission that here it was proposed by the ministry, upon the face of it, to the House of Commons, to enact that a previous conviction should not be an answer to a subsequent prosecution.

12,923. (Chairman.) And that was obviously meant to meet the case you have just cited?—I have no doubt it was solely with that view. It will be seen, I think, that nowhere has that been repeated since in legislation in express terms. That Bill was brought in by Mr. Bruce, who I think was Vice-President of the Council at the time, and Mr. Baring, and was read a first time on March 8th; it was read a second time without debate. I think I have made all the reference I need to that. Then on April 6th, 1866, upon the motion to go into Committee, Mr. Bruce made a long statement, which will



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be found in Hansard, vol. 182, page 1101. I do not pretend to reproduce the whole debate, but I think I do not unfairly select the portions which I desire to bring to the notice of the Commission: "At present," Mr. Bruce said, "before a person could be convicted of disobeying the law, it was necessary to prove service of notice upon the parent or guardian; that necessity—the proof being frequently of considerable difficulty—it was proposed to abolish. When a penalty had once been imposed, however trifling, the Guardians hitherto could not prosecute for continued neglect; it was proposed to give them power to take further proceedings. In principle the Bill would make every man responsible for the non-vaccination of his child, and as every child born since 1853 and not vaccinated remained unvaccinated in defiance of the law there would be no hardship in enforcing the law against all parents who had disregarded it in the case of all children not above 13 years of age." Then Mr. Henley, at page 1103, complained of the want of security, not only that a medical man had the necessary skill and experience, but that he obtained the proper lymph or whatever it was that was necessary for the operation. Other members opposed it; Mr. Ayrton saying, "that besides being inaccurately drawn up" it "bore too much of the stamp of the official departments in which it had been prepared." The Bill was referred to a Select Committee, on the motion of Mr. Harvey Lewis, member for Marylebone. On April 17th the Committee was nominated, with Mr. Bruce as Chairman. In agreeing to the Committee he had stipulated that "it must be distinctly understood that they did not in any way go into Committee upon the principle of the Bill." On June 1st the Bill was reported. Section 5 introduced gratuities to Public Vaccinators for successful vaccination. Section 29 was passed omitting the words relating to a previous conviction. Section 30 inflicted a penalty upon persons inoculating with small-pox. That Bill was withdrawn upon July 23rd, 1866. On April 30th, 1867, a Vaccination Bill was read a first time, and, on May 16th, a second time without debate. On the motion to go into Committee (this is to be found in Hansard, vol. 187, page 1863), Lord Robert Montagu, who, I think, was Vice-President of the Council, which, I think, this subject was linked with then, said: "The Act (of 1853) was not carried out because the machinery was imperfect; the check was not sufficient. . . . The coercive provisions of the law were feeble, ambiguous, and not stringent enough. A similar Bill was introduced last year by Mr. Bruce. It went before a Select Committee, and was sifted carefully clause by clause. The Bill now before the House was almost in the words in which it had come down from the Select Committee." He said nothing about the repeated penalties; on the contrary, in summing up the provisions of the Act, he said it was the interest of the registrar to hunt up every birth, because he got a fee for each one entered, and it was the interest of the doctor to vaccinate every child, because he had a fee for it. Then he added "It was the interest of the parent to take the child to be vaccinated, or he would run the risk of legal proceedings and be liable to a penalty of 1l." Then Sir J. Clarke Jervoise proposed to postpone the Committee until after the Report of the Medical Officer for 1866 had been distributed. Colonel Barttelot supported the amendment, saying: "No evidence was taken by the Select Committee last session. This ought to have been done in so important a subject." Mr. Bruce said: "Compulsory vaccination had been the law of the land since 1853. The present Bill laid down no new principle. It merely collected all the scattered provisions of the law and applied the new machinery which had been found necessary by experience." And if, as there is no doubt, Mr. Bruce was genuine in saying that, it is strong evidence that the Government were unaware, and the House was unaware, that it was passing a clause which would have the effect of accumulating the penalties. After debate the Bill went into Committee, and was reported on June 17th. On the motion for the third reading (this is to be found in Hansard, vol. 188, page 649), Mr. Vanderbyl moved the rejection of the Bill. "The offer of gratuities was a premium for carelessness, as the Vaccinator would always get the same amount and where he had to go a certain distance, more for re-vaccinations than for successful vaccinations." Sir Thomas Chambers would vote against the measure, because he was persuaded that if it were passed an agitation would be commenced which would not cease until the

"Act was repealed." No division was taken and the Bill was read a third time, and became law on August 12th, 1867, as 30 & 31 Vict. c. 84.

Then the question of the lawfulness of repeated penalties was decided in the case of *Allen v. Worthy* under the 31st section of this Act, and the reference to that is to be found in Law Reports, 5 Queen's Bench, page 163, or in 39 Law Journal, Magistrates' Cases, page 36. It was decided in January 1870. The case begins by reciting, *ipsissimis verbis*, the Act of Parliament: "By 30 & 31 Vict. c. 84. s. 31. 'if information be given to a Justice that a child under the age of fourteen years has not been successfully vaccinated, and that notice has been given to the parent of the child to procure its being vaccinated, and has been disregarded, the Justice may summon such parent to appear with the child before him, and if the Justice shall find, upon examination, that the child has not been vaccinated, nor has had the small-pox, he may, if he see fit, make an order directing the child to be vaccinated within a certain time; and if at the expiration of such time the child shall not have been vaccinated, the person upon whom such order shall have been made shall be proceeded against summarily, and, unless he can show some reasonable ground for his omission to carry the order into effect, shall be liable to a penalty not exceeding twenty shillings.' " It will be seen that that clause is as nearly as possible identical with the one I referred to in the Bill brought in the year before, but omits the express provision that one prosecution shall not satisfy the requirements of the law against the individual. It was held by the court "that a parent, having been fined under this section for disobeying an order to have his child vaccinated, may be proceeded against from time to time as long as the child remains unvaccinated. By section 34, in any prosecution for neglect to procure the vaccination of a child . . . if the defendant produce the certificate in the form B., it shall be a sufficient defence, except when the time specified therein for the postponement of the vaccination shall have expired before the time when the information shall have been laid: Held, that the certificate was no answer to proceedings under section 31." Now in this case, the court had to deal with an Act of Parliament in which there were no such words (which one would conceive gave a stronger jurisdiction), as were to be found in the section debated in the case of *Pilcher v. Stafford*, "at any time." In this clause there is nothing of that sort; and if even there were a case in which, after reading *Pilcher v. Stafford*, one could have predicted what the decision would be, one would have supposed that it would have followed it exactly; but the reasoning of the court was that the insertion of this clause showed an intention on the part of the Legislature to do away with that, which it had repeatedly had a proposition before it to do, but which it had always refused to do, namely, to allow the conviction of the defaulting persons more than once. In this case the information was laid by the Superintendent Registrar before a Justice of the Peace at St. Neots, Huntingdonshire. "That the appellant, within the space of six calendar months, did disobey a certain order made by W. Humbley, one of the Justices of the Peace for the county, dated the 29th of April 1869, whereby the appellant was ordered to have Eliza Allen, under the age of 14 years, and the legitimate child of the appellant, vaccinated within seven days from the date of the order, contrary to the form of the statute. The Justice accordingly issued a summons to the appellant to appear at the petty sessions at St. Neots on May 13. At the hearing before the Justices, it was proved that the order mentioned in the information had been made, and that the appellant had neglected to obey it; and it was admitted that the child had not, at the time of the hearing, been vaccinated. The appellant then stated, and the fact was admitted by the respondent, that the appellant had previously, on the 30th of March 1869, been convicted of disobeying an order dated the 11th of March 1869, whereby the appellant had been ordered to cause Eliza Allen to be vaccinated within seven days from that order. It was contended, on behalf of the appellant, that the information now laid against him was for the same offence; and that, therefore, the appellant could not be again convicted; and stress was laid on the concluding words in the judgment of Cockburn, C.J., in *Pilcher v. Stafford*. The Justices, however, considered that their jurisdiction under



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"s. 31 of the Vaccination Act, 1867 (30 & 31 Vict. c. 84.), was not limited to making but one order directing a child under 14 years of age to be vaccinated, and that the neglect to obey each order formed a separate offence punishable on conviction, and that the conviction for disobeying a previous order was no previous conviction of the offence charged in the information; and that, consequently, the case was in no way governed by the decision in *Pilcher v. Stafford*; and that s. 31 of the Vaccination Act, 1867, appeared to them to have been inserted in that Act with the object of avoiding the mischief found to exist when *Pilcher v. Stafford* was decided. The appellant contended that Eliza Allen was then, and since the 20th of April then last past had been in an unfit state for vaccination, and in support of his contention produced a certificate in the Form B. given in schedule of 30 & 31 Vict. c. 84., dated the 20th of April 1869. And it was contended on behalf of the appellant, that the Justices were bound by the terms of 30 & 31 Vict. c. 84. s. 34, to accept such certificate as proof that the child was then unfit to be vaccinated, and that the production of such certificate was reasonable ground for the omission of the appellant to carry the order of the 29th of April into effect." Then there is more reasoning upon it with which I do not think I need trouble the Commission, and I will proceed with the argument. Mr. Graham, for the appellant, argued: "There are two questions, first, whether an order having been made by Justices directing the appellant to vaccinate his child and disobeyed, and the appellant fined for that offence, a second order can be made, and if disobeyed, whether the appellant can be again fined; secondly, whether a certificate given by a medical practitioner in the Form B., that the child is in an unfit state to be vaccinated, is an answer to the second proceedings. With regard to the first question, *Pilcher v. Stafford* is directly in point; 16 & 17 Vict. c. 100. s. 2, and 30 & 31 Vict. c. 84. s. 31, are substantially the same, and the serious consequences stated by Cockburn, C.J., in his judgment in *Pilcher v. Stafford*, would still follow." I will not follow up the argument, but I will go to the argument, if you please, of Sir John Coleridge, then Attorney-General. It is very short. He said: "The latter Act was passed for the purpose of extending the provisions of the former Act, 16 & 17 Vict. c. 100. The latter Act contains all the provisions of the first Act, and also new provisions to remedy the continuing mischief, and to meet the very case that Cockburn, C.J., pointed out had not been touched by the former Act.

"*Pilcher v. Stafford* is correctly decided, and if this had been a conviction under s. 16 of 30 & 31 Vict. c. 84., the case would have been in point. Under that section the child must be vaccinated within three months, and there could be only one offence and one penalty. Sections 16 and 29 are similar to the provisions contained in 16 & 17 Vict. c. 100.; but section 31 creates an offence of a different character. In that section the period within which the child is to be vaccinated is not limited to three months, but extends up to 14 years, and as the object of the Legislature was to enforce vaccination, fresh orders can be made and fresh penalties can be imposed, so long as the parent continues to neglect to have the child vaccinated. He is not convicted for the same offence, but for a fresh and distinct offence of not obeying the order to vaccinate." Then the Chief Justice said: "I think after the full discussion that we have heard on the provisions of this statute, that the decision of the Justices was right, and that our judgment must, therefore, be for the respondent. It is quite clear that by section 31 of 30 & 31 Vict. c. 84., it was intended by the Legislature to give additional powers to the officers appointed for the purpose of ensuring vaccination and enforcing the performance of that operation. This statute, however, does not supersede the machinery provided by the previous Vaccination Act, but in sections 15, 16, 18, and 29, re-enacts what has been provided by the prior statute. By section 15 the registrar is to give notice of the requirements of the Act to the parents of children, which was also necessary under the prior statute. Section 16 makes it incumbent upon parents to cause their children to be vaccinated within a certain time, and this was also required by the former Act. Section 29 makes it an offence if the parents omit to procure their children to be vaccinated according to the requirements of section 16. Section 18 contains a provision that if the Public Vaccinator, or any medical practitioner, shall be of opinion that the child is not in a fit state to be successfully vaccinated, he shall forthwith give a certificate to that effect, which shall remain in force for a period of two months, and shall be renewable for successive periods of two months, until the Public Vaccinator or medical practitioner shall deem the child to be in a fit state for successful vaccination. If no such certificate is given, or if the time mentioned in the certificate has expired, and the child is not vaccinated, the offence is complete under section 29. All that has nothing whatever to do with the intervention of any magisterial authority." (See Question 15,974.)

Adjourned till Wednesday next at 1 o'clock.

## Fifty-fourth Day.

Wednesday, 4th February 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.  
Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary*.

Messrs.  
H. Lankester,  
M.R.C.S.,  
J. Stafford,  
H. T. Chambers,  
T. Windley,  
J. T. Biggs,  
and J. Storey.

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Messrs. HENRY LANKESTER, M.R.C.S., JOHN STAFFORD, HENRY THOMAS CHAMBERS, THOMAS WINDLEY, JOHN THOMAS BIGGS, and JOHN STOREY examined.

12,924. (*Chairman*.) I believe you desire to lay before the Commission certain recent resolutions passed by the Town Council of Leicester?

(*Mr. John Storey*.) This is a resolution passed at a meeting of the Town Council on the 28th January 1890.

"That in the opinion of this Council it is inexpedient and

"unjust to enforce vaccination under penalties upon those who regard it as undesirable and dangerous." There are 56 members of the Council, of whom 45 were present, and the resolution was carried *nem. con.* At a meeting of the Council held on the 25th of February it was resolved. "That the Mayor with members of the



" Council who, as past Mayors, have had experience of the working of the vaccination laws be appointed a deputation to appear before the Royal Commission to present the resolution adopted by the Council at the last meeting in reference to compulsory vaccination; also that the names of Mr. Biggs, Alderman Windley, and the Town Clerk be added to the deputation." At that meeting there were 44 members present, and the resolution was passed *nem. con.*

Messrs. Lankester, Chambers, Windley, Biggs, and Storey withdrew.

Mr. JOHN STAFFORD examined.

12,925. (*Chairman.*) You are an Alderman and Justice of the Peace for the borough of Leicester?—Yes.

12,926. Residing at Elmsleigh Hall, Knighton, near Leicester?—Yes.

12,927. Have you been a member of the Corporation since 1859?—Yes, I have.

12,928. You were elected Mayor of the borough on the 9th of November 1870?—Yes, I was.

12,929. And re-elected for the following year?—Yes.

12,930. During the time you were chief magistrate I believe you adjudicated upon 23 vaccination cases?—Yes.

12,931. Since that time, in your capacity of magistrate, have you adjudicated upon many more?—Many hundreds.

12,932. At the time you were Mayor in the years 1870 to 1872 was there much agitation against compulsory vaccination?—Not at that time; it was just in its infancy at that time.

12,933. What do you think stimulated the agitation after that date?—There were cases which turned up periodically of ill effects which had been felt in families, so that the question gradually grew to be one of considerable importance in the town.

12,934. Was that idea of injury given expression to in the case of prosecutions for non-vaccinating?—Yes, we had it frequently before us.

12,935. Persons declining upon that ground to have their children vaccinated?—Yes, alleging conscientious objections; partly on that ground and partly on the ground that they ought to be themselves the judges of how their families should be treated in a matter of that kind.

12,936. Whatever the reason, there was a conscientious objection to compulsory vaccination?—Certainly.

12,937. Do you think that those expressions of opinion in the case of those prosecutions largely stimulated the opposition to vaccination?—Yes; I think that was mainly the cause. At that time the fine was uniformly 20s., subsequently it was reduced to 10s. by the outside pressure that was brought to bear upon us.

12,938. At that time were there a considerable number of persons summoned for not complying with the vaccination laws who appeared to have failed in compliance, not by reason of mere neglect, but by reason of conscientious objections?—Yes, it was not mere neglect, it was conscientious objection; they were the better class of working people chiefly.

12,939. Has the fact that there has been so largely a conscientious objection felt influenced your views with regard to the propriety of continuing the system of compulsion?—It is due to that partly as well as to the fact of having cases brought clearly to my mind of members of families having suffered from having certain diseases developed owing to the action of this Act.

12,940. Your own children have been vaccinated, I believe?—All of them, and I have been vaccinated myself three times.

12,941. In some cases you say objection was taken upon the ground that injury had arisen owing to vaccination in the case of other members of a family?—In several cases; and in such cases I felt it my duty to avail myself of the powers with which I was invested and not to enforce the Act.

12,942. You dismissed about 14 cases on these grounds, I think?—More than that, I should say.

12,943. You regarded the power conferred upon you as justifying you in treating it as a "reasonable excuse"

12,924a. (*Mr. Picton.*) When you say *nem. con.*, do you mean there was any silent opposition to it?—An amendment was moved to the first resolution; but it was subsequently withdrawn. The amendment was to the effect that as a Royal Commission was now sitting it was undesirable to take any action at the present time; but the amendment was withdrawn, and the resolution passed without dissent.

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that in the belief of the parents one or more of their children had previously suffered from the effects of vaccination?—Yes; I was always very careful not to receive hearsay evidence as to cases of which they had been informed by other people; but I took their evidence as to cases within their own experience.

12,944. When you believed that they were refusing because they had come to the conclusion from something which had occurred in their own family, or their own experience, that injury had resulted, then you did not convict?—I did not.

12,945. You said, I think, that those who were defaulters under the Vaccination Acts were a respectable class of people?—They were really thinking people; the better class of working people; who really thought for themselves, and had very strong conscientious convictions upon the subject.

12,946. The experience which you have had during those years, as magistrate at Leicester, in the enforcing of the law has led you to the conclusion that it is not right to enforce vaccination compulsorily under penal consequences?—That is quite my conviction.

12,947. Do you think that in Leicester the majority of persons who have failed to vaccinate have failed because they object, or merely because they have not troubled themselves about it?—I believe in the majority of cases it is a matter of conviction.

12,948. (*Professor Michael Foster.*) Do I gather that you think the opposition to vaccination arises rather from the amount of injury that may be done in performing the vaccination than from any conviction that the process itself is not an adequate protection against small-pox?—I think it arises in both respects. I think you would have had more vaccination if it had not been compulsory. People do not like to be coerced; they think it is a matter they should judge of themselves with reference to their own families; and in other cases instances have been brought to me in which injuries have apparently resulted, and the people have positively refused owing to those injuries. I think both of those reasons have operated to prevent the carrying out of the Act.

12,949. (*Chairman.*) We have heard of a system of isolation in the town of Leicester in the case of infectious diseases; you do not speak to that matter, I believe?—No, I am not a member of the sanitary committee. You will have that from the chairman of the sanitary committee.

12,950. (*Mr. Meadows White.*) There are two classes of proceedings under the Vaccination Acts, are there not?—Yes.

12,951. One is for not vaccinating in the first instance, after notice, and the other is when the order is made by a magistrate?—Yes.

12,952. Have you exercised any difference of procedure when the summonses have been under the different sections?—No; there has been a uniform fine imposed, first of 20s., and then of 10s., where a conviction has taken place.

12,953. You know that, under the 31st section, the Act gives, apparently, absolute discretion to the magistrate as to making an order to vaccinate a child?—Yes.

12,954. In that case you would exercise your discretion, and you would not make the order?—Certainly not, if I had reason to believe that the parents had brought forward undoubted evidence of any preceding member of their family having suffered.

12,955. The "reasonable excuse" only applies, in your view, under the first group of sections?—Yes; but you are aware that for some time there have been no summonses taken out by the Guardians at all.



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12,956. You have, as a magistrate, and I suppose other magistrates in Leicester have, exercised to the full the discretion given under the 31st section?—Yes, there is a very strong feeling on the part of the magistrates that this sort of thing cannot go on any longer, as it is now.

12,957. Under those circumstances the question of repeated penalty would not occur?—I do not remember a single case of a repeated charge; I have not had one before me.

12,958. In the event of a reasonable excuse having been given in answer to proceedings for not vaccinating within the prescribed period, it would be necessary to have an order?—Yes, in that case I should not fine.

12,959. Supposing there had been a temporary illness in the first instance, and the three months have passed, and then the parent is brought before you, the child not having been vaccinated and the temporary illness having passed away, what would you do in that case?—If they brought before me the fact of a previous child having suffered from vaccination I should not enforce the vaccination.

12,960. But supposing they brought forward no such case?—Then I should be obliged to enforce the law.

12,961. But if there were a reasonable case made?—Then I should lean to that side, undoubtedly.

12,962. The conscientious objection being the belief on the part of the parent that injury would result?—I should not refuse to fine merely on the ground of conscientious objection; it would depend upon the nature of it.

12,963. Would you treat as a conscientious objection the mere objection to compulsion?—No, I should not.

12,964. But if you thought that there were some grounds for believing that injury had resulted in a family you would, I presume, remit the fine?—I should require proof of the injury that had resulted; I should not take what the parties had heard from a neighbour, or what they had heard from a friend, but I should want to know if they had had any injury from a previous vaccination in their own family; that is my guide in the matter.

12,965. Have you any statistics of cases in which such injuries have resulted?—I believe in something like 14 cases it has been proved to me that the parties have suffered injury, and in those cases I have refused to convict.

12,966. (*Mr. Picton.*) The 14 cases were within your own experience?—Yes, I am speaking of my own experience.

12,967. I think when you first sat as a magistrate in Leicester there was not a very strong, or general, objection to the practice of vaccination?—No; but it grew very rapidly. In a few years it became a very crucial point in the town; when the periodical elections for Guardians were going on, “Will you vote for anti-compulsory vaccination?” used to be a test question.

12,968. When you first sat as magistrate you were in favour, were you not, of a compulsory law?—I felt at the time that good results had arisen from vaccination. I certainly did not take the other view.

12,969. Did you not think at that time that a firm enforcement of the law would put down the objection that was entertained to it?—I did, and administered the law accordingly.

12,970. Your views upon that point ultimately changed?—Yes, from the experience I had during a number of years.

12,971. You found that the enforcement of the law by penalty of any kind would not succeed?—Not at all.

12,972. Will you tell us about what is the population of Leicester?—I should think it is 160,000 possibly.

12,973. From your knowledge of the town, what do you think would be the effect of any stern endeavour to enforce the law, say, by imperial authority?—We should have the whole working population up in arms; I am certain they would not submit to it.

12,974. Do you think that the public peace would be endangered?—I am quite certain of it; there is tremendous feeling about it in the town.

12,975. (*Dr. Collins.*) You have spoken of the discretionary power you exercise in carrying out the compulsory provisions of that Act, will you tell us for how long the law has practically been a dead letter in Leicester?—It has been a dead letter for about five years,

12,976. Prior to that time there had been a great many prosecutions?—Yes; and as presiding in the second court I used to have more than my share of them; it was very unpleasant work for me, but I felt it my duty to do what I had to do in the matter.

12,977. I find by a return to the House of Commons, dated the 24th of March 1890, giving the number of prosecutions and imprisonments during the ten years from 1879 to 1889, in the borough of Leicester there were 3,249 persons fined and 31 imprisoned. I understood from what you said just now that those cases would have occurred chiefly during the first five years of that period, because there has been very little done in that way during the last five years?—Nothing at all scarcely.

12,978. As regards the proportion of vaccinations to births, I suppose you could not speak as to that?—I could not.

12,979. (*Sir Charles Dalrymple.*) I suppose there would now be at Leicester a certain pride taken in resistance to the Act?—I should not put it in the way of pride; I should say an honest conscientious conviction that they are doing right.

12,980. In view of that feeling no light which this Commission could throw upon the subject of vaccination would be likely to affect their conclusions?—I am sure they are looking forward to what you will say with great interest.

12,981. Do you think that the “liberty of the subject” theory has had any influence upon the course they have taken?—Men naturally look to it as their right to do what they should with their own families.

12,982. Injury in some cases, plus objection to the fines and compulsion, would probably be the secret of a great part of the resistance which has been offered to the law?—To a certain extent no doubt.

12,983. (*Mr. Whitbread.*) Is the feeling which is prevalent in the town of Leicester spreading in the neighbourhood?—In the villages to some extent; but as there have been no prosecutions in Leicester for some years past the feeling there has somewhat subsided; if compulsion were to be revived again you would have the same feeling coming to the front again straight away. The borough is likely to be enlarged, and there is a very strong feeling that the surrounding villages which are now subject to prosecution are very badly treated, and very hardly treated; they are fined, and I believe in some cases even second convictions have taken place, at all events, in numbers of cases first prosecutions have taken place; whereas in Leicester the people are not placed in that position.

12,984. What I want to know is whether the feeling of hostility to vaccination upon conscientious grounds, which is prevalent in Leicester, is spreading, and largely, in the agricultural districts surrounding it?—In the villages immediately surrounding Leicester no doubt it is.

12,985. (*Mr. Meadows White.*) May I ask was there any record kept of any special case of injury which excited much attention?—I could not say that, but I have in my mind's eye cases in which even diagrams have been brought forward and exhibited.

12,986. But I mean has there been any public inquiry or any voluntary commission sitting upon any of those points?—No; but we have been very careful to verify those points, and to be satisfied that the people had a reasonable case for remission.

12,987. (*Sir William Savory.*) You mentioned that you would remit a fine if you had proof that a previous injury had occurred. What proof would you require?—The statement of the parties that prior to vaccination their child was in perfect health, a beautiful baby; but that in a very few weeks after vaccination the child was covered with sores, or became an object of pity, or even died from it.

12,988. You regarded that as sufficient?—Yes.

12,989. Did you take medical evidence upon the subject?—No, we required very little medical evidence.

12,990. You remitted the fine in 14 cases?—Yes.

12,991. Out of how many?—I have taken some 1,500 to 1,800 cases in my experience.

12,992. (*Chairman.*) I have before me some statistics relating to Leicester, some points in which I will ask you to explain. I observe that in 1873 there were 3,730 cases of successful vaccination. The number appears



to have gradually diminished, until in 1881 there were 2,948 cases; in 1882 there were 2,660; then there is a sudden drop between 1882 and 1883 of nearly a thousand, the number falling to 1,732, a change quite unlike anything to be seen in the years from 1873 to 1882. To what was that special fall attributable?—There was a succession of meetings at that time at which people were advised by no means to submit to the Act; they were advised to refuse to submit to it.

12,993. Then I observe that in 1886 the number has fallen to 598 from 1,376 in 1885?—Yes. Opinion began to gather strength as it went along and, consequently, vaccination summonses ceased to be issued.

12,994. There was no change in the administration of the Act or anything except the growing feeling between 1883 and 1886 to account for this great diminution?—There had been the periodical elections of Guardians; that may have had some influence. It was the test question in the elections “Will you vote for anti-vaccination?” The consequence of that has been that we have got an anti-vaccination Board, and therefore no summonses are issued.

12,995. (*Mr. Meadows White.*) Was there ever any official inquiry made as to any particular case in Leicester?—I do not remember one.

12,996. Either from the central authority, or from a local source?—I do not remember one.

12,997. I suppose there is a strong anti-vaccination society in Leicester?—Yes, there is; but it is very quiet now, because there is nothing going on.

The witness withdrew.

Mr. HENRY THOMAS CHAMBERS examined.

13,003. (*Chairman.*) You are an Alderman and a Justice of the Peace for the borough of Leicester?—Yes.

13,004. And you reside at Inglenook, Stonegate, near Leicester?—Yes.

13,005. Before you became a member of the Town Council you had, I believe, served for several years on the Board of Guardians?—Yes.

13,006. You became a member of the Town Council in the year 1863?—Yes.

13,007. And were a representative of the largest ward in the borough?—Yes, at that time.

13,008. In June 1875 you were elected an alderman, and you were Mayor in the years 1881 and 1882?—Yes.

13,009. In 1884 you were appointed a magistrate for the borough?—Yes.

13,010. During the years you were chief magistrate I believe you adjudicated only upon 11 cases of vaccination default?—Yes.

13,011. Since that time you have adjudicated upon 113?—Yes.

13,012. Have you found a large number of persons who prefer to submit to the payment of fines, or even to imprisonment, rather than have their children vaccinated?—Yes, a large number of cases.

13,013. In those cases do you think the failure to comply with the vaccination laws on the part of the parents was due to negligence or in general to an objection to having their children vaccinated?—To an objection to the law itself, and also to having their children vaccinated at all.

13,014. You do not think it was generally due merely to the neglect of vaccination?—No, certainly not.

13,015. You are, I believe, opposed to compulsory vaccination?—Yes.

13,016. Your view is that the State ought not to interfere with parents, but to leave it to their judgment whether their children should be subjected to vaccination or not?—That is so. I might explain, perhaps, that the smallness of the number of cases which came before me when I was Mayor was due to the fact that it was my privilege to preside over the first court, whereas most of the vaccination cases would be heard in the second court, so that there would be a very much larger number of cases heard during my year of office than appears in my statement.

12,998. But there were meetings, I presume, at which real or supposed cases of injury were brought forward and discussed, no doubt, very strongly?—It was a test question at all the Town Council and other elections “Will you vote against compulsory vaccination?”

12,999. You spoke of hostility to vaccination based upon the injurious results of compulsory vaccination. Can you state whether the epidemic of 1872 contributed in any way to the objection to compulsory vaccination?—It was stated that vaccination was not a preventative against small-pox, and since that time we have been practically free from it; there have been, however, a few cases imported by tramps.

13,000. I understood you to say that the opposition to vaccination dated from that time?—Yes, from about the year 1875 and 1876; that was the time when it was strongest.

13,001. I think the year 1871 marked the highest proportion of vaccinations to births in Leicester?—Yes, very likely.

13,002. (*Chairman.*) It seems to have been very completely vaccinated, I should think, as vaccinations go, later than that, because if you take the year 1873 the number of births registered was 4,446; successfully vaccinated, 3,730, and died unvaccinated, 555; so that that very nearly accounts for the whole of the births?—I have not made a special study of the statistics; I am more able to speak as to the effect of the carrying out of the law in this matter than anything else.

13,017. You have not, I suppose, given any special attention to the statistics with regard to vaccination in Leicester?—I have not.

13,018. Do you think the feeling against vaccination is as great or greater now than it has been at any time?—I should think it is quite as strong as ever, although of course during the last few years there has been much more quietness with regard to it in consequence of there being no prosecutions; but I may add that I think if there should arise any such cases again the feeling would be exceedingly strong.

13,019. Do you think that now all parents who neglect vaccination neglect it on conscientious grounds, or would there be, now that the prosecutions have ceased, a considerable number who would simply neglect it from carelessness or indifference?—I should think both causes would operate. There is no doubt a very strong conscientious conviction upon the part of a very large number of Leicester people against it.

13,020. Are there any notices issued now calling the attention of parents to the duty of vaccination?—I think not. I am not aware of it; they would go from the registrar, not from the Council.

13,021. Are you especially cognizant of the measures taken at Leicester to prevent the spread of infectious diseases, more especially small-pox?—I am; but the chairman of the sanitary committee is here, Mr. Alderman Windley, who is fully conversant with the whole proceedings.

13,022. (*Mr. Meadows White.*) You are still a magistrate?—Yes.

13,023. Cases of this nature have lately not come before you because there have been no prosecutions?—There have been no prosecutions for some length of time.

13,024. When you were a magistrate what did you accept as a “reasonable excuse”?—There would be cases in which parents pleaded that they had lost children, as they believed, rightly or wrongly, through their being vaccinated, and I have witnessed some really heartrending cases of that kind, and I would very gladly pay the fines myself rather than that they should.

13,025. Those were cases, I presume, where the parents alleged that their children had been injured in former cases?—Yes, and some died, it was firmly believed, as the result of vaccination; it may have been so or not, but you cannot persuade them that it was not.

13,026. You accepted their statement?—Certainly; it was honest as far as they were concerned, I am quite sure.

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13,027. And in cases where you have had the child produced to you and you have been asked to make an order, there you would exercise your discretion?—Yes.

13,028. In favour of not making an order?—Yes.

13,029. I think we have heard that there was no public inquiry made into any special case of injury?—I am not aware of any.

13,030. (*Mr. Picton.*) From your knowledge of the town and your observation what do you think would be the effect of any attempt to revive compulsion, especially by external force, that is to say, by force from without the town?—It would be most seriously opposed, I might almost say violently, I think.

13,031. Do you think it might possibly endanger the peace of the town?—I think it is quite probable; if pushed to any serious extent it would.

13,032. (*Dr. Collins.*) I do not think you told us what class of persons were chiefly brought before you as a magistrate under the Vaccination Acts?—Mostly of the artisan class.

13,033. We have been told by a former witness that they were mostly of a respectable class; is that your experience?—It is.

The witness withdrew.

Mr. HENRY LANKESTER, M.R.C.S., examined.

Mr.  
H. Lankester,  
M.R.C.S.

13,040. (*Chairman.*) You are a Justice of the Peace and a member of the Royal College of Surgeons?—I am.

13,041. You are Deputy Mayor, and were Mayor last year of the borough of Leicester?—Yes.

13,042. You were Mayor at the time the resolution was passed which has been submitted to the Commission?—I was.

13,043. I believe you are yourself favourable to vaccination?—Certainly.

13,044. But you are opposed to compulsory vaccination?—Yes.

13,045. Will you favour the Commission with your reasons for your opposition to compulsory vaccination?—Mainly because I believe in the conscientious objection which so many have entertained against its operation; and, secondly, because, wishing as I do to do unto others as I would be done unto, if I strongly and conscientiously objected to vaccination, I should strongly object to have my child operated upon in a way I should deprecate as being injurious to its health.

13,046. (*Sir James Paget.*) Have you yourself seen cases in which serious injuries followed vaccination?—I do not think I can recall any one definite case which has been decided so. I have seen cases in which appearances have arisen which might have arisen from it, but which equally might have occurred apart from vaccination, such as erysipelas of the arm, which has arisen a few days after the operation, showing that the child was not in a healthy condition, and that the vaccination produced it just as any scratch otherwise inflicted might have done.

13,047. Would you consider that any conscientious objections, founded upon the belief that mischief may follow vaccination, are erroneously founded?—I would hardly say that. I have frequently seen cases where infants who were not vaccinated at so early a period as they ought to have been, and who had appeared to be really healthy children, have had eruptions occurring upon them, and I have said to the parents, "Now if I had vaccinated your child you would have accused me of using impure lymph;" and the parent has said "I should, sir."

13,048. So that the conscientious objection in those cases would have been founded upon an erroneous impression of the case?—Yes, it would have been founded on an erroneous impression of the case.

13,049. (*Mr. Dugdale.*) Are the medical men in Leicester generally of the same opinion as yourself, that is to say, favourable to vaccination, but opposed to compulsory vaccination?—I think they would be almost wholly favourable to vaccination. I am not so sure as to their impression with regard to compulsory vaccination. I think the majority of them would generally be in favour of compulsory vaccination.

13,034. Do the Guardians now appoint a Public Vaccinator in Leicester?—I think they have one, but I do not think he does anything.

13,035. His office is a sinecure?—Quite so.

13,036. (*Mr. Whitbread.*) Is this at all a class question in Leicester?—It is difficult to answer that question. As far as my knowledge goes it is more a working class question than otherwise.

13,037. Is vaccination prevalent among the richer classes?—No, it is not prevalent. I forget now the exact number of births, but the number vaccinated is a miserable minority.

13,038. But amongst the wealthier classes?—I should think that would be so amongst the wealthier classes. I should think that out of nearly 5,000 births during the year there were only about 220 vaccinated of the whole number.

13,039. (*Chairman.*) In the last year for which we have any record, namely, 1888, 4,815 births were registered; the successful vaccinations were 219, of which 59 were by the Public Vaccinator?—I have not the exact figures with me for this year, but I believe the proportion is about the same, so that all classes of the community seem to be pretty well of one mind about it.

13,050. (*Mr. Whitbread.*) Has the fact of the law being compulsory, in your judgment, increased largely the number of those who have set themselves in opposition to the law?—Certainly. If it had never been made compulsory, I do not think there would have been the same opposition and agitation against it.

13,051. Would there, in your opinion, be any opposition in Leicester to the continuance of the practice of vaccination subsidised by the Government if it were no longer compulsory?—I think the feeling would be so strong now that it would meet with opposition on any ground. There seems to be a deep-rooted conviction against it in many cases, and an entire apathy in many others; that may be fostered by the fact that for so many years in spite of vaccination not being carried out we have had a remarkable immunity from small-pox, which is I daresay largely owing to the strict quarantine and isolation which we practice there.

13,052. Has the population ever resented the steps you have taken in order to isolate cases when you have been threatened with an invasion of small-pox?—No; I think in all cases, although we have no power to enforce quarantine, it has been acceded to. I recollect a case in which one of a group who were quarantined insisted upon coming out after having been two or three days in quarantine; but I believe with that exception they have acceded to it.

13,053. What happened in that case?—I think in that case the man went. I am not quite sure about it, he was a drunken fellow and was dissatisfied at not being allowed to smoke.

13,054. (*Chairman.*) Do you think the existence of this compulsory vaccination law and the opposition to it, and the desire to substitute something else, resulting to some extent from that opposition, has led to a compliance with these quarantine regulations which might not have been obtained if you had swept away the vaccination laws altogether?—I am not sure what answers I can give to that question. Of course the cases in which quarantine has been carried out have been very exceptional. We have had but few invasions of small-pox, and those have not necessitated the quarantining of many people.

13,055. This quarantining has been regarded I suppose in Leicester as a substitute for vaccination?—Rather as an additional mode of safety as preventing the extension of the disease from houses in which small-pox has broken out. The disease has generally been imported by tramps coming into the town; and in those cases it has been dealt with by the isolation of the people from the infected houses.

13,056. Did the suggestion come from people opposed to the vaccination laws as being a better system than compulsory vaccination?—I think it rather originated with the sanitary committee than with those who were advocating anti-vaccination.



13,057. What I wanted rather to get at was this : were they instigated to it and led to enforce it as strictly as they could by reason of the fact that vaccination was being abandoned and that they wanted to find a substitute?—That would be one motive for it ; but I should think it would be from the general desire to be free from the taint of small-pox, and so carrying out the functions of the sanitary committee which has no duties in connexion with vaccination.

13,058. (*Mr. Whitbread.*) Is any notice given to the public that in case any house is visited with small-pox it will be isolated?—I believe that is generally understood. The Notification of Disease Act is carried out so rigidly with respect to all infectious diseases, especially small-pox, that every one is perfectly aware that notification should be given of the least indication of small-pox ; and that has been carried out.

13,059. Do all medical men in Leicester agree in the desirability of the strict isolation of all persons in the house in which the outbreak has occurred?—I believe so. All individuals in the house are removed to the Fever House, where the individual suffering is placed also ; it is a mile away from the town in an open district.

13,060. I suppose provision is made for any loss workmen may incur by being removed from their work?—Yes, certainly, they are supplied with food and lodging, but not loss of wages.

13,061. By whom?—By the Corporation.

13,062. Out of what fund?—That I am not prepared to answer. I might say that I did not come prepared to undergo an examination, but simply that I thought it my duty as Mayor to present the documents which were read by the Town Clerk. At the same time I should be glad to answer any questions in my power.

13,063. (*Mr. Picton.*) As a medical man I will ask you after the experience of 1885 and the absence of compulsion do you feel secure about the practical safety of the town?—I cannot say that I do, my own feeling is that if we had such an epidemic throughout the whole country as we had in 1872, Leicester could hardly be kept exempt with any amount of isolation and quarantine, and entertaining the views I do about the necessity of vaccination, I believe that Leicester would suffer decimation.

13,064. But holding to that view, you still object to compulsion?—Upon the ground which I have already expressed, that I object to the liberty of the subject being interfered with with respect to people's children.

13,065. Your objection to compulsion has been brought about owing to the strong evidence you have had brought before you of the feeling of the Leicester people upon the subject?—Certainly. I should have my own children vaccinated if I had any.

13,066. What do you think would be the consequence of any attempt to enforce vaccination rigorously in Leicester?—I think it would not be tolerated for a moment ; there would be an uprising of the town against it.

13,067. (*Dr. Collins.*) You spoke of some alleged injuries arising from vaccination which you thought had led to opposition. I understand you to say that some of those injuries might have arisen independently of vaccination?—Yes.

13,068. Amongst others, I think you mentioned erysipelas and skin eruptions?—Yes.

13,069. In reference to cases of erysipelas, do you think that in those cases in which serious erysipelas has followed vaccination erysipelas would have arisen without vaccination?—I think any slight scratch, say with a needle or a bruise, would have led to erysipelas in those cases, and even possibly to death. I will not say that I attribute those evils altogether to vaccination. I am ready to admit that some evils may arise from want of care in the performance of the operation, or possibly there may be some casualty arising from the imperfection of the lymph.

13,070. Speaking of vaccination and erysipelas following, do you think that in that case the erysipelas would have arisen without vaccination?—I know that in one case erysipelas followed upon vaccination in a child vaccinated by myself. I filled up the certificate as "erysipelas following vaccination ;" but I am not aware that that was due to any impurity in the lymph.

13,071. Are you aware that it is customary after vaccination to see an areola upon the arm?—Yes.

13,072. Sometimes that areola is more extensive than at others?—Yes.

13,073. Is that areola erysipelatous?—Yes, if extensive, frequently it is.

13,074. It might cover a considerable portion of the body?—It might cover the arm, and then extend to the body, certainly.

13,075. I think you said if there had been no compulsory vaccination there would have been very little agitation against vaccination?—I am hardly prepared to say that ; but I think compulsory vaccination has increased the agitation.

13,076. I think experience has shown that without the compulsion there has been very little vaccination?—There was considerable vaccination in Leicester before the compulsion came into force.

13,077. But I believe since the law has ceased to be enforced the children vaccinated have come to be a "miserable minority," as one witness stated?—Yes.

13,078. I believe there has been very little small-pox in Leicester of late?—Yes, very little. Every case which has been imported has been rigidly dealt with at once.

13,079. To what do you attribute that immunity?—To the rigid carrying out of quarantine and isolation.

13,080. You stated that on several occasions tramps had introduced small-pox into Leicester. Do you know whether they were vaccinated or not?—I cannot say.

13,081. I think you stated it as your opinion that in the event of another epidemic of small-pox Leicester would be "decimated"?—"Decimation" is, perhaps, too strong a term, but I think we should suffer very much more heavily amongst the children than a population which had been well vaccinated.

13,082. Was that result—decimation—the experience of any small-pox epidemic in any town in this country prior to the introduction of compulsory vaccination?—We have not had any large epidemic of late years since the introduction of compulsory vaccination. I was saying to one of my fellow travellers, coming up in the train, that if one of my daughters had not been vaccinated I should not allow her to nurse a case of small-pox, whereas if she had been vaccinated I should not hesitate to allow her to do so.

13,083. (*Dr. Bristowe.*) You do not mean to say, do you, that the inflammatory areola of vaccination is the same thing as erysipelas?—Certainly not.

13,084. (*Dr. Collins.*) What distinction do you draw between them?—The ordinary areola would be that arising from the irritation caused by the vaccine lymph ; erysipelas would be a distinct kind of inflammation from that.

13,085. What would be the distinction?—I think it would arise somewhat from the character of the constitution in the individual vaccinated, showing some depravity of blood from aberration of health.

13,086. Apart from the theory of its cause, what would be the objective difference?—I can hardly give you an answer which would be satisfactory to you ; it is not easy to define. There is erythema and erysipelas.

13,087. (*Dr. Bristowe.*) You look upon cow-pox as being a specific disease?—Yes.

13,088. And you look upon erysipelas as a specific disease?—Yes.

13,089. (*Dr. Collins.*) Has the specific cause of either or of both been differentiated?—I should hardly be prepared to say that.

13,090. (*Sir William Savory.*) But the effects are widely different between the areola of vaccination and erysipelas?—Yes.

13,091. One is a serious disease and the other not?—Yes.

13,092. Erysipelas tends to spread and may lead to death?—Yes.

13,093. But the areola of vaccination does not do anything of the sort?—It does not.

13,094. So that practically the distinction between the two is clear, and it would be an abuse of terms to class the areola of vaccination with erysipelas?—Certainly.

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Mr. 13,095. (*Dr. Collins.*) I understood you to say that it was the habit of the areola of vaccination to extend in certain cases?—In very rare cases to extend to such a degree as to become erysipelatous.

Mr. 13,096. Do I understand you to say that in some rare cases the tendency is for the inflammation round the vaccine vesicle to extend considerably?—In an abnormal case it might.

13,097. If it did extend the consequence might be serious?—Yes.

13,098. What other distinctions do you draw between a case of that kind and a case of true erysipelas?—If it extended to such a degree as to become serious, I should say that there would be a probability of some erysipelatous inflammation being set up.

13,099. Could you draw any precise difference or distinction between those cases in which the areola round the vaccine vesicle does extend, and in those in which it does not, may there not be great varieties of extension?—There are not any great varieties between those which are ordinary and those which are extraordinary.

13,100. Is there a sharp line of distinction between the two?—One sees in the very large proportion of cases that it is ordinary, and that it is very exceptional when it is extraordinary.

13,101. Is there a sharp line of distinction between the two?—I should hardly say that.

13,102. You would say that there was not a sharp line of distinction between the ordinary and the extraordinary?—No, I should say there was.

13,103. What is the difference?—That the one is what we expect, and the other is what we do not expect.

13,104. Do they differ objectively; would you put concisely and precisely for me what are the essential differences between erysipelas and an abnormal extension of the areola around the vaccine vesicle?—I should say that in, practically, all cases where it would be decidedly abnormal it would be arising from erysipelatous inflammation.

13,105. Apparently the distinction you draw is a numerical and not an essential one?—The difference appears to me to be clear.

13,106. (*Professor Michael Foster.*) You would regard in those cases the erysipelas as added, so to speak, to the vaccination?—Yes, as added.

13,107. (*Chairman.*) You were asked if it was an extension of the areola; "extension" seems to suggest that it is merely the same thing spreading. I understand your view to be that if it is erysipelatous it is a new thing supervening; it is not the same thing spreading?—Some children have scarcely any areola, others have more; others may go to an extravagant degree, and when that is the case it is generally combined with something of an erysipelatous character, not amounting to erysipelas to any extent endangering life.

13,108. But I understand your view to be that where there is erysipelas it is something different from the areola which is generally found?—That is so.

13,109. (*Dr. Collins.*) In addition to erysipelas you mentioned some skin eruptions which were alleged in some cases to result from vaccination?—Yes.

13,110. Do I understand you to say that in all cases, in your opinion, that allegation is incorrect?—Not in all cases, but from the fact I mentioned that eruptions of that kind had arisen in children who had never been vaccinated, it is equally possible they might arise after vaccination without being caused by vaccination.

13,111. Because they arise apart from vaccination, does that prove that they would have arisen without the

vaccination?—No; that may be the cause in some cases.

13,112. I do not know whether your attention has been drawn to a paper on Vaccination Eruptions, by Mr. Malcolm Morris, in the "British Medical Journal" of November 29th, 1890?—It has not.

13,113. (*Sir Edwin Galsworthy.*) If compulsory vaccination were abolished, do you think the objections to vaccination would gradually die out?—I should question whether they would. There is now such a pronounced hostility to it that I think nothing would tend to lessen it.

13,114. Is that to compulsory vaccination do you mean, or to vaccination in general?—I think it applies to vaccination in general.

13,115. (*Chairman.*) You think that the intense opposition to vaccination in general which now prevails is in part due to compulsion, that if there had not been compulsion there would not have been so great a hostility to vaccination?—I think so. I think the accentuation of the matter in Leicester is largely due to there having been some persons in Leicester who made it the business of their lives to develop agitation years ago, which has led to its spreading through the better and middle classes, so that now nearly all the population is opposed to it.

13,116. (*Sir Edwin Galsworthy.*) Would you not prefer to make the isolation compulsory in order to guard against spread of an outbreak?—That would lead to difficulties; if we were to have such an epidemic as that which occurred in 1872 no system of isolation probably could be carried out, the problem would be too great for the town to grapple with.

13,117. If the motive "isolation is a substitution for vaccination" weighed with the sanitary authority, I suppose it would be as well that their motive should not be known?—It is known now; everybody knows now that isolation is practised for the prevention of the spread of small-pox.

13,118. And you have no apprehension of conscientious convictions against isolation?—Certainly not.

13,119. (*Professor Michael Foster.*) I suppose that a large number of people in Leicester now are not only hostile to vaccination, but have been led to the opinion that vaccination in itself is useless as a protection against small-pox?—That sentiment does exist largely.

13,120. (*Mr. Picton.*) You spoke about epidemics just now; I think your memory as a medical practitioner in Leicester goes back to the year 1872; at that time there was an epidemic in the town?—Yes.

13,121. Do you remember the state of vaccination in the town at that time?—Yes, pretty well.

13,122. Were there more than 5 per cent. unvaccinated of the births of the previous year?—I should scarcely think there would be. It is not a point that I could verify myself.

13,123. Leicester was considered a well vaccinated town?—Yes.

13,124. You remember the circumstances of the recent outbreak at Sheffield?—Yes.

13,125. Are you aware that it extended to Bradford and Leeds?—Yes.

13,126. Is there not considerable intercourse between Leicester and Sheffield?—Yes.

13,127. Do you remember any case of small-pox being introduced from Sheffield?—I think there were one or two; but we were keenly on our guard against it, knowing the possibility of its being imported.

13,128. And it did not spread any further?—No.

The witness withdrew.

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M.P.

Mr. JAMES ELLIS, M.P., examined.

13,129. (*Chairman.*) You are a Member of Parliament and are chairman of the Leicester School Board?—Yes.

13,130. You desire to present to the Commission a resolution of that School Board?—I do. It was a resolution passed on the 3rd of March 1890: "That in the opinion of this Board it is inexpedient and

"unjust to enforce vaccination under penalties upon those who regard it as unadvisable and dangerous, and that a copy of this resolution be forwarded to the Royal Commission."

13,131. Was that resolution unanimously arrived at, or was there any division?—I think there was one member who opposed it. It was not a political ques-



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tion at all; it was proposed by a doctor, who was then on the Board, and seconded by another member and passed with, I believe, one dissentient.

13,132. (*Mr. Picton.*) I would like to ask you as to the experience of your Board in regard to the difficulty of getting vaccinated teachers; is it not the fact that the Education Department insists upon vaccination before recognising pupil-teachers?—This form I have here is that adopted by the Education authorities, they will not recognise a teacher unless all these questions are answered satisfactorily; the second is, "Has he, " or she, been successfully vaccinated?"

13,133. Have you found any difficulty in carrying that out?—We are beginning to find very considerable difficulty. Up till now we have been able to procure in Leicester itself teachers who have been vaccinated; but there is a case which has occurred within the last fortnight, and we have this note about a teacher. "It appears from E. A. Banbury's medical certificate that she has not been successfully vaccinated. Until this operation has been performed my Lords cannot, both for her own sake and in the interests of the children attending the school, consent to her engagement." (*See Questions 14,668-90.*)

13,134. Had she passed successfully all the examinations besides?—Yes, she had.

13,135. Do you consider her eligible for a pupil-teacher?—Yes; she is eligible, and but for this she would be appointed as a pupil-teacher.

13,136. Do you find any difficulty in getting teachers who have been vaccinated?—We could get them outside the town, but we desire that female pupil-teachers

should, on account of their home life, be engaged in Leicester if possible; therefore, if we could we should like to remove this restriction.

13,137. You believe that the practical difficulty is likely to increase?—Certainly, because there are hardly any being vaccinated in Leicester at all; it must increase.

13,138. (*Sir Edwin Galsworthy.*) Had that candidate never been vaccinated at all?—No.

13,139. Never attempted?—No.

13,140. Why not?—Practically there is no vaccination in Leicester at all; there have been only two or three a month vaccinated in Leicester during the last six months.

13,141. (*Mr. Meadows White.*) What would her age be?—13 or 14. 14 years ago half the people in Leicester probably would have been vaccinated, but we have got down now to the fact that only two or three per month are vaccinated.

13,142. This question would have been answered if she had been successfully vaccinated 14 years ago, in her infancy?—Yes; it is only whether she has been vaccinated successfully, not whether she would be free from small-pox if it visited the town.

13,143. You are personally, I believe, favourable to vaccination?—I should certainly vaccinate members of my family.

13,144. (*Dr. Collins.*) So that this order of the Education Department will interfere with that or some other individual practising her vocation?—It must materially interfere with the inhabitants of Leicester doing so in that particular.

The witness withdrew.

Mr. THOMAS WINDLEY examined.

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13,145. (*Chairman.*) You are an Alderman and chairman of the sanitary committee of Leicester?—Yes.

13,146. And you have been so for many years?—Yes, 14 or 15 years.

13,147. Will you be good enough to explain to the Commission the precautions which are taken by the sanitary committee with the view to preventing the spread of infectious disease, especially small-pox?—In the first place we have the Notification of Diseases Act in operation in Leicester, and we therefore get very early information of a case.

13,148. How long has that been the case?—According to the Medical Officer's report, since about the year 1878-79; it was recommended by Dr. Johnston, the then assistant Medical Officer of Health in 1877, and we went to Parliament in the following year. We were one of the first towns in the kingdom to obtain such an Act. We got a private Bill to that effect.

13,149. At the time you are speaking of it was an Act obtained by the Leicester Corporation?—Yes, there were only two other towns, Bolton and one other, that were before us. The effect of our powers is that we get immediate notification of the occurrence of a case of small-pox.

13,150. Is a medical man bound to notify?—Yes, as a matter of fact we trust to the medical man; we furnish him with stamped circulars, upon which he forwards information as soon as called in. We have never found any difficulty in that respect.

13,151. Can you tell me in what year it was that that Act came into operation in Leicester?—The book I have before me is the assistant Officer of Health's report for 1877. In that report to the sanitary committee he is recommending that we should adopt the same power of notification as was obtained in the Bolton Improvement Act. We went to Parliament, and in 1878 or 1879 obtained the Act.

13,152. Receiving in that way notification of the existence of infectious diseases, what steps do you take?—A note comes to the sanitary office, and the inspector thereupon telephones to the hospital to the matron to get the ward ready, provided that there is no case there previously, and to send the porter out with a horse and ambulance to the house where the case is reported from. While that is being done, the inspector goes to the house and awaits the arrival of the man from the hospital with the van, and assists him in getting

the case into the ambulance; the case is then sent up to the hospital. Then he endeavours to persuade the inhabitants of the house, or anyone who has come in contact with the patient during the previous few days, to go with him to the hospital and to remain there in another ward in a distant part of the premises for about a fortnight, in quarantine, offering, of course, that we will provide them with all that they require in the way of refreshments, and so on, and in the majority of cases, in nearly all the cases that have occurred, they have gone into quarantine in this way at the request of the inspector or the Officer of Health, as the case might be.

13,153. When did that system come into operation?—It was in the year 1877. If you will allow me I will read the paragraph which has reference to it. This is the report of Dr. Johnston, the then assistant Officer of Health, and he says this: "As the plan which I adopted in the removal of these cases is novel, and may be found useful by Officers of Health in other towns for preventing the spread of the disease, I may be pardoned if I again draw attention to it. In any house where a small-pox case occurred I endeavoured to impress the inmates with the fact that the removal of all the members of the family to the hospital was the best course to adopt, not only as regarded their own individual welfare, but also that of the town at large. And I am glad to say that all complied with my request, left their infected habitations and became inmates of the hospital. Altogether 22 unaffected cases were thus admitted into quarantine, and of these, three after admission sickened. The first case sickened in 48 hours, the second in 72 hours, whilst the third showed no symptoms of the disease until the twelfth day. Now all these cases must have been infected before admission, as small-pox appears on the skin on the fourteenth day after the infection of the disease has been received into the system."

13,154. (*Mr. Meadows White.*) Does he say in how many groups, or were the 22 all in one group?—No, they were not all in one group. "After most careful inquiry I was unable to trace the source of the primary infection, but the 11 succeeding cases were found to have received it from the first affected." So that there were 12 cases.

13,155. The 22 were persons who were not attacked?—The 22 were persons who were in quarantine.

13,156. (*Sir Edwin Galsworthy.*) Is that in one year?—Yes, in 1877.



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13,157. How many cases of small-pox were there in that year?—"The disease was hæmorrhagic in character, and affected altogether 12 cases."

13,158. (*Chairman.*) Then I should gather that there had been nine cases originally, and that the 22 were people who had come in contact with these nine cases, and that of the 22, three afterwards sickened?—That is so. Then this was his report in 1884: "No fatal case of this disease was recorded in 1884, but three distinct outbreaks were reported in the town and neighbourhood, and in each instance the infection was conveyed from London. Owing to the immediate removal of all the inmates of each house where the disease appeared to the Fever Hospital at Freahe's Ground, together with the thorough disinfection and lime-washing of the infected houses, the further spread of the disease was arrested. During the last eight years there have been no fewer than 20 importations of small-pox into the town and its immediate neighbourhood; the disease has, however, always been stamped out, owing to the fact that the health committee have always succeeded in promptly removing to hospital, not only those stricken with the malady, but also all the other inmates of each infected house." Turning back to the question of quarantine, I omitted to say that after a case is sent from the house in which he was residing the inspector takes possession of the key of the house and allows no one to enter it until it has been thoroughly whitewashed and disinfected, and, if necessary, any old bedding there may be about destroyed, to be replaced by the authority when the patient returns.

13,159. Those persons who are secluded in this way in the hospital while in good health, during the time they are secluded receive, at the expense of the corporation, the necessary food?—Yes.

13,160. Supposing they are men who are in work do they receive a substitute for their wages?—I do not think that they have been paid—I do not remember any case that was paid; in one case I recollect there were some navvies, some railway men, at work, and one of those men complained to me that he did not like remaining there doing nothing; he jocularly remarked that he might as well hang himself; the following week I found he was "down," as we call it, with small-pox, and he died. I had to remonstrate with him and tell him that he might have taken the infection from the patient and that he had better remain there a little while, and he did remain.

13,161. Do they all submit?—Yes, practically. We have had one or two cases in which the people have refused. One young man declined to go; and we should in that case warn his employer, and should send the inspector day by day to visit him, to see whether he developed the disease. As a matter of fact, one so watched sickened, and in that case he had to go into the hospital.

13,162. Do you find any difficulty in inducing people, or in their relations allowing them, to come to the hospital when they are attacked with the disease; you have no means of compelling them?—We have no means of compelling them, but we find no practical difficulty at all. The majority of cases have been tramps or people who have come into a lodging-house; the lodging-house keeper gives information of the case at once; he is naturally very glad to get rid of the patient; and in the better class of houses they have been very glad to get a patient away, and we have found no objection, as a rule, to the inhabitants going into quarantine.

13,163. Could you give the Commission any idea how often cases arise where you have the people going into quarantine; it does not occur, I presume, every year?—Councillor Biggs, who will be examined, will be able to give you every figure in the way of statistics; it is all on record but of late we have had very few indeed.

13,164. (*Mr. Dugdale.*) What I understand you to do at Leicester is that you have a hospital outside connected with the town by telephone?—Yes.

13,165. Upon the first intimation of small-pox you telephone to the hospital, and they send an ambulance, and you remove the patient straight in the ambulance to the hospital?—That is so.

13,166. Then you quarantine, or endeavour to quarantine, the remainder of the people living in the house which the patient came from?—Yes.

13,167. You disinfect it and whitewash it afterwards?—Yes.

13,168. Have you ever followed the cases of persons you quarantined after they had left the hospital to see whether they had taken the small-pox afterwards?—We have never followed them.

13,169. Have you ever heard that any of them did take small-pox after they had left the hospital?—Never.

13,170. But some of them have been stricken during the 14 days that they are there?—Yes.

13,171. How large is the hospital?—There are five wards; three wards are attached to a corridor running alongside.

13,172. How many patients would it accommodate?—I should think we could take 200 in all.

13,173. Counting in the patients and the people in quarantine?—Yes; it was built in 1872, at the time of the epidemic, for small-pox alone; but since that epidemic, and in consequence of the measures adopted by Dr. Johnston, only one ward has been occupied by small-pox patients. It has been kept empty in case an epidemic arose; it has been foretold that we should have a terrible epidemic, so this large ward has been always kept empty in case the epidemic should occur; the three remaining wards have been used for scarlet fever cases.

13,174. So that it is a hospital in use generally for infectious diseases in Leicester?—It is, with the isolating wards attached to it.

13,175. How many could you hold in quarantine in those isolated wards?—If the place were empty we could hold a considerable number, but as there is only one case cropping up at a time, as a rule, it is no considerable matter.

13,176. But I want to know what amount of accommodation you have in the ward you devote to quarantine?—I should think that the ward would, perhaps, hold 50 people.

13,177. Can you give me any idea of the cost of erecting the existing hospital?—The original cost, I think, was about 7,000*l.*; it was built of wood and iron.

13,178. Can you tell the Commission at all about how much a year it costs to maintain?—Of late years about 2,000*l.* a year.

13,179. What is the population of Leicester now?—It is assumed by the Registrar-General now, I think, at 153,000, but I think that is beyond the number we shall find by the census.

13,180. Have you any statistics of what has been paid to the persons who have been placed in quarantine?—I do not think there are any statistics, but if anything were paid it would be infinitesimal.

13,181. Out of what fund would it be paid?—If anything were paid it would be paid out of the common fund, but I do not think anything has been paid except for the replacement of clothing or anything destroyed.

13,182. What is the length of the term of quarantine?—14 days.

13,183. Is the case of the young man you mentioned just now the only case in which there has been a refusal to go into quarantine?—I do not recollect more than one or two.

13,184. Have they been mostly cases of tramps?—Yes; sometimes they have been tramps sent from the workhouse, or working men coming from lodging-houses.

13,185. The persons placed in quarantine have been chiefly workmen, navvies, and tramps?—Yes. One case was the son of a hotel keeper. We do not know where he could have got the disease; it was suggested that it was at a race meeting.

13,186. To what extent did your quarantine extend there?—There was no quarantine there; we simply took the patient.

13,187. (*Professor Michael Foster.*) Have you had no case amongst men or women from a large wholesale house, where they live in the house?—No, I do not think we have had; there were several cases in the town arising from one outbreak, but we had no difficulty in dealing with it; we stamped it out.

13,188. Have you formed any idea what course you would take, supposing small-pox to break out in a large



drapery establishment?—We should quarantine all in the establishment who came in contact with the patient.

13,189. Did you attempt to quarantine the hotel?—I am not sure whether the young man was living at the hotel; certainly he was related to the people living at the hotel, but I could not charge my memory with the fact whether he himself had been living there.

13,190. (*Mr. Whitbread.*) You described to the Commission the various steps you take when a case of small-pox occurs, and I would ask you, after the disease is once notified to you is there any other step afterwards that is taken which has the sanction of any law?—Yes, I think so. The Public Health Act of 1875 sanctions what we do.

13,191. Does it give you authority to take the patient?—Yes, I think so, under the ordinary clause “if found “without proper lodging and accommodation.”

13,192. But supposing a case is found with proper lodging and accommodation?—But the majority of cases are found without.

13,193. Have you had no case in which a person has had proper house accommodation, who has had small-pox?—Very rarely, if any; if in a four-roomed cottage a case was found we should not consider that proper lodging and accommodation for a small-pox patient.

13,194. Not if the patient had a room to himself?—Certainly not.

13,195. What would be “proper lodging and accommodation”?—Where you could effectually isolate the patient I should say; and I know how difficult that is, in my own experience, even in scarlet fever cases, quite apart from small-pox.

13,196. (*Sir Edwin Galsworthy.*) Have you ever had a case in which the patient has refused to go to the hospital?—I do not think we have had any such case as that; we had a case of a person declining to go into quarantine on one occasion, and we watched him, and I believe I am right in saying that we had to take him afterwards owing to his having sickened.

13,197. (*Mr. Whitbread.*) There is no sanction, is there, to your removing them, if you cannot persuade the other inhabitants to go to the hospital?—There is no law.

13,198. Suppose the house is a large one, let in tenements, have you any such cases in Leicester?—Speaking generally, I do not think we have.

13,199. What is the number of families living in each house?—There are occasionally cases in which two families live in one house to save rent; but there are no cases of flats in Leicester.

13,200. Do you think it necessary to take the whole of the inhabitants of a house into quarantine?—We should certainly wish to take every person who has been connected with the patient, either living in or visiting the house. If a young man were suffering, and his sweetheart had been visiting him, we should take her, and *vice versa*. If we could not get him into quarantine directly, we should watch the person somewhere, either in our hospital or elsewhere where he was at work.

13,201. How do you watch them?—We send the inspector to see.

13,202. Are you authorised to do that?—We should consider that we are authorised to do that under the powers of the Public Health Act.

13,203. Supposing a person objects to be inspected, have you any power to go and watch that person?—I do not know that there is any clause in the Act of Parliament saying that you may not do this, that, or the other, but in the exercise of our powers as a sanitary authority we should consider we were within the law in making such inspection.

13,204. Supposing a person refuses you admission, have you any power to go to the house?—We should have no power to go to the room, but the inspector would go to the house and knock, and make inquiries; it would be his business (and we should take care that he did it) to ascertain where the person was working, and make known the fact.

13,205. Then may I ask you what are your own views?—The views of the whole of the committee were strongly in favour of vaccination, and my own views too for a very considerable period; and if they have varied now it is from the manner in which the medical

profession have shifted their ground, and the failure of vaccination to protect the people.

13,206. Have you been vaccinated?—Yes; I was re-vaccinated at the last epidemic in 1871. I might, however, remark that our committee have adopted this practice apart from the question of vaccination altogether. It has been often suggested that the sanitary committee of Leicester were doing this as a committee of anti-vaccinators, whereas they were, as a committee, strongly in favour of vaccination. The majority of them are vaccinators now; but I should say that the majority are against compulsory vaccination. That would be my position. I am so far against vaccination myself as not to have had my last child vaccinated.

13,207. Do you think, from the position you occupy in Leicester, you can safely rely upon the system of isolation, such as that which you carry out, and abandon vaccination altogether; do you consider you are safe?—I can only answer from my experience since we began in 1877. We have always succeeded during that time, and I do not see any reason why we should not succeed in the next dozen years as we have done in the last; nor do I see any reason why any other town should not succeed in the same way. Small-pox does not spring up spontaneously in a town; it comes from somewhere; we get timely notice of it when it breaks out, and I am looking to that as the best means of dealing with it when it breaks out. Many times medical men have written to me to say that every one of us who would favour anti-vaccination would be implicated in what might happen; and that would be a very terrible thing. We have had to work with that hanging over our heads, but as I have said, we are acting entirely apart from anti-vaccination. We did this at the instigation of our Officer of Health, who was in favour of vaccination at the time; but I think he is now much more in favour of isolation. Isolation and other sanitary measures that we have adopted have secured us hitherto, and I do not see any reason to fear their not having the same beneficial effects hereafter. I would rather trust it than any other system.

13,208. (*Sir Edwin Galsworthy.*) If there should be an outbreak of small-pox in Leicester, should you have your child vaccinated?—I do not know that I should, unless we came near the seat of the disease; if there were any cases in the next house I might. I do not see any need for vaccination, except in cases such as that where you are liable to come into contact with the disease. I do not see the force of vaccinating all Leicester because there may be a tramp, or wayfarer, stricken with small-pox in the bottom of the town. I do not see why, on that ground, we should all be vaccinated when we have the patients sent away.

13,209. Are the people engaged in the hospital all vaccinated?—I do not think the matron has been. If she has, it was a long time ago. She is a woman of 50, and she is against vaccination, whereas the Officer of Health is in favour of vaccination; so was the gentleman who introduced this plan to us, he vaccinated, and the present Officer would vaccinate all who came to him.

13,210. (*Mr. Meadows White.*) There is nothing inconsistent between the two plans, isolation and vaccination might go on concurrently?—They might go on concurrently.

13,211. Have you ever been advised by your legal adviser as to your power of quarantine?—Our Town Clerk has never advised us against the process we have adopted.

13,212. I should like to have it even from you, though not a lawyer, how far you feel justified under your Act of Parliament in carrying on your system, which you have described to us of isolation, in removing patients?—I think we are justified under the clause of the Public Health Act.

13,213. In providing hospital accommodation?—Providing hospital accommodation; the particular clause we rely upon is that we are authorised “where a person “has not sufficient lodging and accommodation.” I think those are the words.

13,214. Do you keep the expense of quarantine separate?—No, it goes into the hospital yearly account.

13,215. Is it a public hospital?—It is.

13,216. It is not a private hospital?—No.

13,217. Is there any audit of the accounts by any Local Government Board auditor?—No.

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13,218. Therefore those expenses have never come under any critical observation?—No.

13,219. (*Chairman.*) Have you any corporate property, apart from your rates?—Yes, we have a large estate.

13,220. (*Mr. Meadows White.*) You have a borough fund?—Yes.

13,221. (*Mr. Picton.*) As a matter of fact, have you not found that small-pox has usually broken out or been imported into the poorer part of the population?—Yes.

13,222. People living in what you call the lower districts of the town?—Yes, undoubtedly.

13,223. Have you had any cases of middle class attacks?—Yes, there have been cases transferred from amongst the respectable working class population.

13,224. But you have not found any difficulty in getting them to submit to quarantine, except in the case you mentioned?—No.

13,225. As to the fear of an epidemic, is it your calculation that upon the appearance of an epidemic in Leicester it would manifest itself sporadically in only a few cases; it might be in different neighbourhoods, but that the cases would be two or three to begin with?—Yes.

13,226. You do not fear the possibility of 100 or 200 cases arising at once?—I do not see how it is possible myself.

13,227. Have you, as chairman of the sanitary committee, inquired into the progress of epidemics elsewhere?—Not specially; I have read an account of the progress of the epidemic at Sheffield, and I think we should have stopped that by our plan.

13,228. You do not think that arose all at once?—No, it arose, I think, from want of notification and isolation.

13,229. You think that by getting notice of cases as they arose you would stop the progress of the disease?—Yes.

13,230. You rely upon the medical opinion that small-pox never springs up spontaneously?—I think so; they assure us that it never arises spontaneously.

13,231. You are chairman of the sanitary committee, and you have been so for 14 or 15 years; can you give us any information as to the improvements in sanitation in Leicester? First, I will carry you back to 1872, to the time of the small-pox epidemic there. Can you tell the Commission what was the condition of the town at that time in regard to drainage and in regard to the removal of refuse?—I entered the Council, I think, the following year, or somewhere thereabouts, and we have been proceeding with sanitary improvements from that time to the present. For instance, the town was at that time honeycombed with the old fashioned middens. We have abolished that system by ordering them to be filled up, adopting the pail system in their place. Another thing was that there were a great number of surface wells in close proximity to those ashpits and middens. I suppose we have closed the great majority of the wells in the town, so that there are very few surface wells left in Leicester at the present time. The drainage was about as bad as it could be. We had overgrown the system of drainage, which was provided for a town of half the population at present existing. Owing to the contour of the town, lying, as it does, in a basin, there is no free outfall; therefore the drains were to a large extent silted up, or half silted up. We have had those drains cleared out and an entire new system of sewers is now in process of construction; that work has also been going on during my period of office in the Council.

13,232. Have you looked into the report on the Sheffield epidemic?—I have not.

13,233. Are you aware that there was a large area of open cesspools in Sheffield at the time that epidemic broke out?—I have been told that the sanitary condition of the town was something frightful.

13,234. Your experience is that the removal of your cesspools has been very beneficial to the public health?—Undoubtedly, in purifying the atmosphere very considerably. There used to be in the courts large filthy pits full of ordure, which would only be emptied once in three or four months—these were of the most offensive character; we have got rid of all those pits entirely; I do not suppose that there are any left in any of the

courts in the town, and very few left in Leicester at all.

13,235. (*Chairman.*) Do you know what was the death-rate in Leicester last year?—It was about .18 per 1,000. The yearly report is not out yet.

13,236. (*Mr. Picton.*) Of course, I cannot appeal to you as I would to a medical gentleman; but as a practical man, having presided over this question for years, is it your opinion that sanitation has no effect upon small-pox?—I should think that sanitation has an effect upon all zymotic diseases, in keeping them away. If a case occurred there would be a better chance of its not spreading on account of the improved sanitation.

13,237. Have you found small-pox different from other diseases in that respect; have you found that it is more likely to occur in the unhealthy districts of the town?—The cases have occurred in the lower parts of the town, on account of the class of persons attacked, such as tramps in lodging-houses.

13,238. (*Chairman.*) Your cases have all been imported?—Yes.

13,239. So that you can hardly say with your present experience what effect sanitation has had upon the existence of small-pox?—I can only say that sanitation has improved the general health of the town very considerably.

13,240. It is not your experience that it has broken out in the badly drained parts of the town and not broken out elsewhere; but in your experience the cases which have occurred have all been imported?—They have all been imported.

13,241. (*Mr. Picton.*) I think you are the editor of a newspaper, as well as chairman of the sanitary committee?—Yes.

13,242. You have, therefore, extensive means of knowing the public opinion of Leicester?—Yes.

13,243. How would you characterise the feeling about compulsory vaccination in Leicester; is it superficial or otherwise?—I think there is a very decided opinion against it.

13,244. What would you say would be the effect of any compulsion in Leicester applied by any external authority?—It is very difficult to say what would happen. Vaccination appears to have gone out in all classes; there is scarcely any vaccination at all, quite apart from the people who have strong views as to anti-vaccination; everybody appears to have given it up as a useless measure so far as Leicester is concerned; and to attempt to restore its practice in Leicester would, I think, be altogether out of the question; it would be an impossibility; I do not know how you would do it. There would be a very strong outcry; I think the thing is impossible.

13,245. The abstinence from vaccination is not confined to one class of the population?—I took out some figures as to the numbers of persons who have been vaccinated, and I was very much surprised at the result. It clearly shows that people have ceased to care about vaccination, or are satisfied with the course we have taken whenever small-pox has occurred. I do not know what other reason can be assigned for it.

13,246. (*Chairman.*) Is it not possible that the number of those returned as vaccinated may not completely tally with the number of those actually vaccinated? What occurs to me is that the prosecutions having ceased, and therefore no consequences following from not sending in a certificate of vaccination; in some cases there may have been vaccinations, but neglect to send in the certificates?—I understand that certificates are always sent in to the Registrar of Births. I know the Registrar has the returns of those vaccinated by private medical men, but how he gets them or when he gets them I do not know.

13,247. Supposing a child were vaccinated and no return were sent in nothing would follow upon it, would it?—Nothing would follow; but I believe that every child vaccinated is returned to the Registrar.

13,248. It only occurred to me that when you ceased to prosecute, people would not trouble themselves to send in the certificate of vaccination?—I think you will find from the Registrar that he will be able to answer that question. The feeling against compulsion I think is universal; it is regarded as intolerable now, and I do not think that any efforts of any Board, or any authority, not even a regiment of soldiers, would bring about vaccination by compulsion again in Leicester. I cannot



say, of course, what will happen, but I know that the profession have been expecting this dreadful epidemic to arise in Leicester which was to have a great effect in alarming everybody, but it has not come.

13,249. (*Dr. Collins.*) I think it is under the 124th section of the Public Health Act of 1875 that you have the power to remove a patient. I will read the section. "Where any suitable hospital or place for the reception of the sick is provided within the district of a local authority, or within a convenient distance of such district, any person who is suffering from any dangerous infectious disorder, and is without proper lodging or accommodation, or lodged in a room occupied by more than one family, or is on board any ship or vessel, may, on a certificate signed by a legally qualified medical practitioner, and with the consent of the superintending body of such hospital or place, be removed by order of any Justice, to such hospital or place, at the cost of the local authority; and any person so suffering, who is lodged in any common lodging-house, may, with the like consent and on a like certificate, be so removed by order of the local authority?"—That is the clause. Our powers are strengthened by the Act of last session, the Public Health Amendment Act, 1890. There is a little additional power given there as to removal and as to minor matters.

13,250. Have you had any notification of any case of small-pox arising in a common lodging-house?—Yes, I believe I may say that.

13,251. Did you isolate?—Yes.

13,252. And remove the other inmates?—Yes.

13,253. There was no spread of the disease?—No, there was no spread.

13,254. It was put to you whether you had heard of any one released from quarantine having subsequently had small-pox or communicated it to others. I apprehend you must have heard of it under the Compulsory Notification Act if it had occurred?—We must have heard of it in Leicester if it had occurred; we never heard, therefore I take it that no such thing occurred.

13,255. Although I understand from you that it has not been the object of the sanitary committee to substitute this method of isolation and quarantine for vaccination, I understand that practically that is what has come about, that vaccination has largely dropped off, and that this is the only method relied upon in Leicester for meeting an outbreak of small-pox?—Yes, that is so; but we adopt these measures entirely apart from vaccination, that being a medical question which we leave the medical men to deal with.

13,256. It was put to you whether you did not think the two things might be worked concurrently to the same end?—It may be so, but I should not myself advise people if they have any objection to vaccination to be vaccinated, because I consider that isolation serves the same purpose.

13,257. You stated that in Sheffield they had no notification or isolation?—Not at first, certainly. I do not think that they had any attempt at isolation at first.

13,258. Are you able to continue the comparison between Sheffield and Leicester as to vaccination?—I do not know what is being done in Sheffield now.

13,259. At the time of the epidemic did you ascertain whether Sheffield was considered well or ill vaccinated?—I understood Sheffield to be a well vaccinated town, and so was Leicester up to 1872, when we had 346 deaths; the same will apply to the previous epidemic some years before. It came to be regarded as an occurrence which must be looked for every few years; it was thought that there was a wave of scarlet fever or small-pox which must be expected every few years. That was our experience up to 1872 when we had not adopted our present plans, and when vaccination was the chief thing trusted to for protection.

13,260. Therefore it comes to this, that Sheffield has relied upon vaccination and not had any efficient means of notification and isolation, while Leicester has relied mainly on isolation and notification during the last 10 years that vaccination has become practically a dead letter?—The *Guardians* have given up putting in force compulsion, and we have gone on our way, and succeeded in stamping out every outbreak that has occurred.

13,261. What I wanted to know was whether you think in view of the experience of Sheffield a universal vaccination would be a valuable addition to your system?—I should like to see the universal disuse of vaccination and the universal adoption of the plan adopted in

Leicester, because there is no possible danger in our plans, whereas there is a good deal of danger (of which I think evidence will be laid before you) in the other cases plus the failures.

13,262. (*Dr. Bristowe.*) Hitherto I understand your experience of isolation has had reference only to outbreaks amongst the lower classes?—They have chiefly occurred amongst the lower classes.

13,263. Supposing such cases occurred amongst the better classes, do you think you would have equal facilities in isolating them; do you think you could bring into operation your practice of taking the patient away from his household and putting him into quarantine?—I think we should not have much difficulty as to the patient, seeing that everybody appears to be alarmed at small-pox; if it were an individual we might isolate him in his own house; it would depend upon the circumstances of course. I think our powers would be practically equal to the occasion. Of course in the higher classes everybody is alarmed at small-pox; indeed I need not say the higher classes but all classes, and they would work with the sanitary authorities in measures which are recommended for the general protection, in fact, I think we should have less difficulty with the higher classes.

13,264. If your hospital were full I presume we should have a general rush for vaccination?—I cannot say that. I do not think we shall see it full. At any rate, we have had a good deal of experience, so that I am less in fear than I might be otherwise or than I was a few years ago when the prophets were pretty thick upon us; they have left off prophesying lately.

13,265. (*Mr. Hutchinson.*) Do I understand you to say that you think there is no real danger attaching to your plan of the disuse of vaccination?—I think there is no danger.

13,266. Do all the inhabitants of Leicester remain continuously in Leicester?—I should not think they do.

13,267. You travel about?—I travel about.

13,268. Do not you think that you are exposed to an increased risk of taking small-pox when you go to other districts?—I do not think so; because it is acknowledged that after a certain age vaccination ceases to have any effect, and people who travel are mostly of advanced years.

13,269. Would the inhabitants of Leicester when they travelled resort to vaccination?—I do not think so. I think they would be very foolish if they did.

13,270. Why do you think so?—Because that would be anticipating their going into the midst of small-pox.

13,271. It is a possibility, and I understand you admit that small-pox is very contagious?—Yes, it is very contagious.

13,272. And you admit also that to a certain extent vaccination is a protection against it; re-vaccination at all events?—It may be.

13,273. If you were a medical man going amongst small-pox you would be vaccinated presumably?—Not being a medical man I cannot say.

13,274. Supposing you were a medical man liable to be exposed to the danger of small-pox you would be vaccinated probably?—Very possibly I might.

13,275. (*Mr. Picton.*) It is quite open to the inhabitants of Leicester to be vaccinated if they please?—Certainly; there are able vaccinators in Leicester.

13,276. (*Mr. Hutchinson.*) I take it from your admission that those who are vaccinated gain additional protection?—Yes if they go to any district where small-pox is raging.

13,277. Can anybody be certain as to that, say he is coming to London?—I think so, you do not necessarily go into the midst of small-pox. Take Sheffield, hundreds of people went from Leicester to Sheffield at the time the epidemic of small-pox was on there and they did not bring small-pox back with them.

13,278. Do you think they went with equal safety as if they had been vaccinated?—Apparently they did, because they came back without it.

13,279. If they had been protected would they not have gone with more safety?—If they were safe I do not see how they could have been safer. If they returned without the disease they must have been safe.

13,280. That was an accident?—I do not admit it to be an accident.

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Mr.  
T. Windley.

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13,281. (*Mr. Picton.*) You do not advocate any prohibition of vaccination?—I do not advocate its prohibition. I say, let every man be persuaded in his own mind; but I say it is an intolerable thing to put a man in prison, or sell his goods, and subject him in prison to hard labour. I have seen men come out of prison with their hands lacerated with the hard labour they have been exposed to.

13,282. (*Chairman.*) They cannot subject them to hard labour, can they, for this offence?—At all events I know they have done an illegal thing, if it was illegal, in Leicester; I am sure that it was not known at the time to be illegal.

13,283. (*Professor Michael Foster.*) You are quite content with the power of your system to grapple with whatever may happen without any increased power, trusting to persuading the people to go to the hospital?—Yes, I would rather persuade them.

13,284. Are you content to rest upon your system as it is, the voluntary system, beyond what little power you have under the Public Health Act, or do you think it will be necessary that in order to be quite secure to introduce some further compulsion?—It seems very difficult if you give people such powers to know what they will do under the Act. I would rather be content with our powers as they exist, but I daresay there will

be hereafter much more stringent powers given to local authorities to compel isolation. I should imagine that the tendency would be in the direction of separating those sick from infectious diseases and all other diseases.

13,285. (*Sir William Savory.*) Are you for compulsory isolation?—I should rather be in favour of compulsory isolation than of compulsory vaccination.

13,286. Supposing a man's conscience went against compulsory isolation?—I should respect his conscience, but I should isolate him where he was, if possible. I do not think that a man should be a centre of disease to anybody.

13,287. (*Dr. Collins.*) I see by referring to Dr. Barry's evidence that at Sheffield during the epidemic there were more than four thousand cases of small-pox in people who had been vaccinated?—I daresay that is so.

13,288. (*Mr. Meadows White.*) Sheffield has been put to you; do you happen to know how many towns in England have followed the example of Leicester with regard to quarantine?—As to quarantine I do not know a case. Some I think do attempt it.

13,289. Do you know if there are any other towns which have not adopted your system but have escaped small-pox?—I am not aware that there is any small-pox in England now, but if it does occur an epidemic follows, as was the case in London not so long since.

The witness withdrew.

Messrs.  
J. Leeson,  
J. T. Biggs,  
and  
L.P. Chamberlain.

Messrs. JOSEPH LEESON, JOHN THOMAS BIGGS, and LIONEL PERCY CHAMBERLAIN examined.

13,290. (*Chairman.*) You, gentlemen, are respectively ex-chairman, a former member of, and clerk to the Leicester Board of Guardians?

(*Mr. Leeson.*) Yes.

13,291. You present to the Commission the resolutions adopted by the Board of Guardians?—Yes; I have here an abstract of correspondence and resolutions of the Guardians of the Leicester Union relating to the administration of the Vaccination Acts for the period from 1868 to 1889, and it was the wish of the Guardians, if it pleased your Lordship and the Commission, that the clerk should read the introduction to the Commission.

(*Mr. Chamberlain.*) The first resolution I will read is as follows:—

“On February 4th, 1890, at a meeting of the Guardians Mr. Councillor Biggs attended and having presented the extracts and papers prepared from the records and minute books of the Board, the Board unanimously resolved that they should be presented to the Royal Commission by a deputation.”

The history of the subject in Leicester is as follows:—  
“The Guardians of the Leicester Union respectfully present to the Royal Commission on Vaccination the records of their administration of the Vaccination Acts in the borough of Leicester. In doing this they would observe that it is no exaggeration to say that the name of Leicester is more prominently associated with the agitation against compulsory vaccination than that of any other town in the United Kingdom or probably in the world. It would however be an error to assume from this circumstance that the enforcement or practice of vaccination had to any great extent been omitted or neglected until recent years. In no other town has the Board of Guardians as the vaccinating authority more fully responded to the successive requests of the Poor Law Board or subsequently yielded a more implicit obedience to the expressed wishes of the Local Government Board, in promoting the encouragement or enforcement of the Vaccination Laws.

“It is true that Dr. Buck the first Medical Officer of Health in his report on the sanitary condition of the borough in 1851 ascribes an epidemic of small-pox which occurred in 1845 to the neglect of the Board of Guardians in carrying out the first Vaccination Act which was passed in 1840. After referring to the remarkable and general agreement of ‘medical and scientific persons’ as to the power of the ‘happy discovery’ of vaccination by the ‘immortal Jenner’ to prevent small-pox, and the obstacles thrown in the way of the successful working of the Vaccination Acts he writes at page 5 of the Health Report for 1851 thus:

“‘When the Legislature declared that the blessing of this sanitary enactment should be made operative in

“‘every Union in the kingdom, we find that in 1842, “‘considerably more than two years after the passing “‘of the Act the Board of Guardians after frequent “‘deliberations, came to the conclusion that it was “‘“inexpedient to carry out the provisions of the “‘“Vaccination Act in Leicester”; and as a not un- “‘natural consequence of thus dealing with the Vaccination Act we find that in the year 1845 small-pox “‘appeared as an epidemic in the town, and in six “‘months proved fatal to no less than 41 individuals.’ “‘In January 1845 the Poor Law Board wrote as follows:—

“‘Poor Law Commission Office,

“‘Somerset House,

“‘15th January 1845.

“‘Sir, “‘I am directed by the Poor Law Commissioners to “‘acknowledge the receipt of the vaccination return of “‘the Leicester Union which was called for by the “‘Commissioners on the 2nd instant.

“‘The Commissioners observe that 47 cases were vaccinated by Mr. Stallard at the Union Workhouse but “‘that none of such cases are returned in the proper “‘column as having been successful, and they therefore “‘request to be informed, of the 183 cases successfully “‘vaccinated by this gentleman, how many of them “‘were vaccinated at his private residence and how “‘many at the Workhouse.

“‘The Commissioners further observe that Mr. Toss- “‘will has not vaccinated any cases through the year. “‘The Commissioners wish his attention to be called “‘to the subject, and that the whole of the Vaccinators “‘may be urged to use greater efforts to induce the “‘residents of the Union to allow their children, who “‘have not already been vaccinated, to undergo the “‘operation, as the Commissioners think that out of “‘2,082 births more than 551 children might have been “‘vaccinated by the Public Vaccinators in the course of “‘the year to which the return relates.

“‘I am, Sir,

“‘Your most obedient Servant,

“‘E. CHADWICK,

“‘Mr. B. G. Chamberlain,

“‘Clerk to the Guardians,

“‘Leicester Union.’

“‘Secretary.

“‘Before the close of the year the Guardians took “‘more active steps to secure the vaccination of infants, “‘which met with the approval of the Commissioners, “‘as will appear from the following correspondence:

“‘Poor Law Commission Office,

“‘Somerset House,

“‘4th December 1845.

“‘Sir, “‘The Poor Law Commissioners having observed “‘by the quarterly return of the Registrar-General of “‘Births, Deaths, and Marriages recently published “‘that small-pox prevailed to a great extent in the



" Leicester Union during the last quarter, deem it necessary again to call the attention of the Board of Guardians to the subject of vaccination.  
 " It is stated by the Registrar of the east district of the Union that since 1840 vaccination seems to have been totally neglected, to which he attributes the great increase of deaths, having in last quarter registered 73 deaths from natural small-pox, four of the parties only having been vaccinated and those only very doubtful cases.

" The Commissioners observe by the return which you have recently made to them that there were 2,237 persons vaccinated by the Public Vaccinators of the Union during the year ended the 29th September last, but as there were 2,499 births in the Union during the year, and only 1,089 cases where the children were under one year of age, they think that in all probability there is a large number of the children born during the year still unvaccinated.

" The Commissioners under these circumstances would advise that the attention of the Public Vaccinators be called to the large mortality which has lately been caused by small-pox, and to the probable number of children still unvaccinated, and that they should be urged to use their best endeavours to extend the practice of vaccination in their respective districts.

" The Commissioners request to know if the Guardians have adopted the suggestions contained in their letter of the 12th August last in which they called the attention of the Guardians to the mortality which had been caused by small-pox in the then preceding quarter.

" I am, Sir,  
 " Your most obedient Servant,  
 " GEO. CRODE,  
 " Assistant Secretary.

" Mr. B. G. Chamberlain,  
 " Clerk to the Guardians,  
 " Leicester Union."

" Leicester Union, Clerk's Office,  
 " 18th December 1845.

" Vaccination.

" I am directed to acknowledge the receipt of your letter in reference to the practice and extension of vaccination within this Union. Regarding the statement of the registrar of the east district, that since 1840 vaccination seems to have been totally neglected, I am desired to state that the number of persons vaccinated yearly, has progressively increased, and that in comparing the numbers with those vaccinated by the Public Vaccinators it should be borne in mind that among the tradesmen and higher classes the vaccination is performed privately and by their own medical attendant.

" Immediately upon the receipt of your letter of the 12th August last the Guardians caused a number of large placards to be printed and posted in all the most public parts of the town as well as causing them to be put up in the schools, warehouses, and factories throughout the town.

" The Guardians are of opinion that nothing will induce the greater portion of the poorer classes of the community to avail themselves of the advantages of the Vaccination Extension Act, except a small money payment be made to them for bringing their children to the Medical Officer. Excepting at those times when small-pox is prevalent the Medical Officers have great difficulty in persuading them of the necessity of vaccination.

" I have the honour to be, Gentlemen,  
 " Your obedient Servant,  
 " B. G. CHAMBERLAIN,  
 " Clerk.

" To the Poor Law Commissioners,  
 " London."

" Poor Law Commission Office,  
 " Somerset House,

" Sir,  
 " 22nd December 1845.  
 " I am directed by the Poor Law Commissioners to acknowledge the receipt of your letter of the 18th instant relative to the arrangements of the Board of Guardians of the Leicester Union for the extension of the practice of vaccination, and I am instructed by the Commissioners to thank you for your communication and to express the satisfaction

" of the Commissioners with the steps taken by the Guardians.

" I am, Sir,  
 " Your most obedient Servant,  
 " E. CHADWICK,  
 " Secretary.

" To Mr. B. G. Chamberlain,  
 " Clerk to the Guardians,  
 " Leicester Union."

" It was not until 1853 that an Act was passed making vaccination compulsory.

" This Act of 1853 was further amended by an Act in 1861 to facilitate prosecutions, but there are no records to show whether prosecutions actually commenced until after the passing of the Act of 1867. This Act (1867), which is now cited as the 'principal Act,' not only amended but consolidated all the preceding Acts. Yet it failed to fully realise the expectations of its promoters. It was discovered that the appointment of Vaccination Officers was optional and not obligatory. To remedy this defect in the Act and more rigorously enforce vaccination, an amending Act was passed in 1871, the year of the Select Committee of the House of Commons on Vaccination.

" The transfer of the duties of the Poor Law Board to the Local Government Board necessitated a further Act of Parliament to explain the Act of 1871. Under this Act of 1871 which referred to the Poor Law Board as executive authority it was possible for Boards of Guardians to evade their responsibility to the Local Government Board which had succeeded to the authority of the Poor Law Board. Hence the Act of 1874 which established the authority of the Local Government Board in vaccinal matters over Boards of Guardians.

" Notwithstanding the permissive character of the Act of 1867, the Leicester Board of Guardians with a ready complaisance appointed Mr. Maskell as Vaccination Officer on July 28th, 1868. His appointment was renewed annually until 1872, when he was permanently appointed, and such appointment confirmed by the Local Government Board.

" The effect of this appointment in securing infantile vaccination is apparent on comparing Table A. with Table B. These tables may be further compared with Table C., which shows the great decline of vaccination in recent years. These important returns (Table C.) were first presented to the Board of Guardians in 1884, and they have since been moved for and supplied in each succeeding year until 1888, when the last return was published. *(The tables were handed in. See Appendix II., Tables A., B., and C., pages 413-4.)* There has been a subsequent return since this was issued, which is included in Table C.

" Following closely upon the appointment of the Vaccination Officer in July 1868, a spirit of opposition to compulsion was manifested in the town, and prosecutions commenced even at this early date. This appears from the fact that at a meeting of the Guardians on the 3rd November 1868, on the application of Mr. Maskell, the Vaccination Officer, the Board resolved that he 'be empowered to take the necessary steps to procure a compliance with the provisions of the law.'

" On the 23rd November John Garner, and on the 4th and 8th December 1868, George Saddington, were summoned before the magistrates. These two cases were dismissed owing to the uncertainty of the magistrates as to the meaning of the law. On the 15th January 1869, Selina Allsop was summoned and her case was dismissed. But William Johnson was on the same date fined 20s. or 14 days' imprisonment; and he went to prison. On March 15th, 1869, three others were summoned before the magistrates. One case was dismissed, one paid a fine of 20s. which was imposed; and the other, Joseph Smart, went to prison for 14 days.

" Strong feelings of indignation were expressed in the town when these first prosecutions and imprisonments took place. It was these prosecutions that led to the formation of a league in Leicester in opposition to the compulsory law.

" The conflict thus started proceeded with varying degrees of intensity, until in 1881 and 1882 the elections to the Board of Guardians, began to turn on the question of compulsory vaccination. During the years 1882-83 the question was very much agitated, and in 1883 at the election of the first triennial Board of Guardians, it became the most important question of the hour. Meanwhile the prosecutions had grown

Messrs.  
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“ from two only in 1868 to 1,154 in 1881, and several  
“ opponents of compulsory vaccination had gained seats  
“ on the Board. On the 9th January 1883, the Board had  
“ declined by 14 votes against 8 to authorise the Vac-  
“ cination Officer to apply for distress warrants against  
“ 17 defaulters.

“ After the election in April 1883 the first occasion for  
“ testing the feeling of the newly-elected Board oc-  
“ curred in June 1883 when, in consequence of the  
“ defeat of Mr. P. A. Taylor's motion against compul-  
“ sory vaccination in the House of Commons one of  
“ the members of the Board gave notice to renew the  
“ prosecutions which had remained in abeyance since  
“ the vote of 9th January 1883.

“ The resolution to renew prosecutions was moved  
“ by Mr. A. Panter on the 10th July 1883; but an  
“ amendment moved by Mr. J. T. Biggs was carried by  
“ 18 votes against 14, being a majority of four against  
“ the renewal of prosecutions. On the 2nd October  
“ 1883 another resolution authorising prosecutions was  
“ moved by Mr. G. K. Billings, and this resolution was  
“ carried after an exciting debate by the casting vote  
“ of the chairman, the number voting on each side  
“ being equal, that is 16 against 16. The fate of nearly  
“ a thousand defaulters was thus decided merely by a

“ casting vote. This decision was soon challenged.  
“ On the 27th November of the same year the question  
“ was again discussed and the renewal of prosecutions  
“ once more affirmed by 19 votes against 17 being a  
“ majority of two. Notwithstanding this decision pro-  
“ secutions were not immediately resumed. Owing to  
“ the nearness of the Christmas holidays and the stag-  
“ nation of trade usual at this season, a tacit under-  
“ standing was arrived at for the temporary suspension  
“ of proceedings.

“ During the existence of this Board from 1883 to  
“ 1886 prosecutions from various causes remained in  
“ abeyance during a period of about half the duration  
“ of the Board's term of office. But during the other  
“ half of the period no fewer than 2,274 proceedings  
“ were taken before the magistrates. As may well be  
“ imagined this enormous number of prosecutions in-  
“ cluding 185 distrains and 24 imprisonments pro-  
“ duced great excitement in the town and led to a large  
“ number of meetings protesting against the action of  
“ the Guardians. These protestations culminated in a  
“ national demonstration at Leicester against the com-  
“ pulsory Vaccination Acts, and the conduct of the  
“ Guardians, which was held on the 23rd March 1885.”

Adjourned till Wednesday next at 1 o'clock.

## Fifty-fifth Day.

Wednesday, 11th February 1891.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir EDWIN HENRY GALSORTHY.  
Sir WILLIAM SAVORY, Bart.

Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. BRET INCE, *Secretary*.

MESSRS. JOSEPH LEESON, JOHN THOMAS BIGGS, and LIONEL PERCY CHAMBERLAIN further examined.

13,292. (*Chairman to Mr. Biggs.*) You stated that the prosecutions had grown from two only in the year 1868 to 1,154 in 1881; can you give me the number of prosecutions year by year between those dates?—In 1868 there were 2; in 1869, 12; in 1870, 24; in 1871, 15; in 1872, 49; in 1873, 20; in 1874, 19; in 1875, 27; in 1876, 107; in 1877, 238; in 1878, 254; in 1879, 287; in 1880, 132; and in 1881, 1,154.

13,293. Pausing there for a moment, I want to ask you a question upon that point. Between 1868 and 1875 there was no substantial increase in the number of prosecutions; it varied between very small limits; 49 appears to have been the highest?—(*Mr. Chamberlain.*) That is so.

13,294. Then in 1876 there is an increase; the highest between 1876 and 1880 inclusive being 287 cases of prosecution; in 1880 there were only 132: that does not represent anything like the deficiency in the amount of vaccination shown by the return which you put in, because in 1879 the number of births was 4,695 and the number of successful vaccinations only 3,086; there were 772 died unvaccinated and 25 were postponed by medical certificate; then there were 538 removed and not found; that would still leave a margin, would it not?—Yes, of 280 unaccounted for, which will be found in the next column. (*Mr. Biggs.*) I propose dealing exhaustively with that subject later on if you would kindly postpone it till I reach that part of my evidence.

13,295. That table showing the number of births and the number of successful vaccinations is not very important unless in connexion with the question of the effect of compulsory vaccination. (*To Mr. Chamberlain.*) Would you continue the historical summary of the facts which is presented by the Guardians in the document you were proceeding to read when we broke off on the last

occasion?—“ Subsequent events proved that this de-  
“ monstration practically settled the question of com-  
“ pulsion in Leicester. At the election of Guardians in  
“ 1886 the principal question before the electors was  
“ that of enforcing vaccination. A large majority of the  
“ candidates expressed themselves against the principle  
“ of compulsion, and with few exceptions these were  
“ returned. The votes cast for the opponents of com-  
“ pulsion rose from about 41,000 in 1883 to nearly 48,000  
“ in 1886, while the votes for the advocates of prosecu-  
“ tions fell from about 31,000 in 1883, to about 20,000  
“ in 1886. The result of the election was seen in the  
“ fact that at the first meeting of the newly-elected  
“ Board notice was given to rescind the order for prosecu-  
“ tions. On May 4th 1886 this order was rescinded  
“ on the motion of Mr. J. T. Biggs after a long debate  
“ by 27 votes against 8. Since this decisive vote no  
“ attempt has been made to reverse the decision then  
“ arrived at, and on the completion of the prosecutions  
“ then in progress prosecutions entirely ceased.

“ At the third triennial election of the Guardians in  
“ 1889 the vaccination question once again monopolised  
“ attention. Such was the force of public opinion  
“ evidenced by the falling off in vaccinations from 3,730  
“ in 1873, to 332 in 1887, that almost all the candidates  
“ voluntarily pledged themselves against compulsion.  
“ The votes for candidates opposed to compulsion still  
“ further increased from 48,000 in 1886, to over 66,000  
“ in 1889, while those cast for the few advocates of  
“ compulsion declined to about 4,500 from 20,000 in  
“ 1886.

“ In every contested parish excepting one the opponents  
“ of compulsion carried their candidate at the head of  
“ the poll; and in all parishes excepting two where  
“ more than one member was required they carried the  
“ whole of the seats. At the first meeting of the new

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" Board notice of motion was given to endorse the previous non-prosecuting policy of the retiring Board. On April 30th 1889 on the motion of Mr. J. W. Goddard this policy was once more emphasised by the significant majority of 31 votes against 3. A number of deputations of ratepayers and others have at various times waited upon the Board, and their representations as to the administration of the law have received the careful consideration of the Guardians.

" Such is the position of the question in Leicester at the present day. In presenting these papers to the Royal Commission the Leicester Board of Guardians wish respectfully but emphatically to declare that in their deliberate judgment the law of compulsory vaccination can never again be enforced in Leicester."

13,296. (*To Mr. Biggs.*) You are a member of the Town Council of Leicester?—Yes.

13,297. Are you also a member of the Board of Guardians?—Not at the present time.

13,298. But you have been?—I have been a member of the Board of Guardians six years.

13,299. You have devoted considerable attention to the subject of vaccination and the vaccination laws as administered in Leicester?—I have.

13,300. You were a Guardian from 1883 to 1889?—Yes.

13,301. Dealing in the first place with the statistical information, you have collected the number of cases of prosecutions which have taken place in Leicester during recent years?—They have been furnished to me by the Chief Constable. (*See Question 13,664.*)

13,302. And those are what you have just stated to the Commission?—They are.

13,303. To the year 1880 inclusive the prosecutions never exceeded 287 in any one year?—Possibly not.

13,304. Although in that year 400 are stated as unaccounted for?—That is so in the Guardians' table.

13,305. The cases accounted for, including not only those vaccinated, or dead unvaccinated, or postponed by medical certificate, but cases removed and not found?—It would not include the cases removed and not found because the number of those is 573 for that year.

13,306. But I think the number unaccounted for in the previous column includes the 573?—No, the number unaccounted for is 400; the number "removed and not found" is not included in that number.

13,307. But you have taken the cases removed and not found as accounted for?—Yes.

13,308. You have the various headings, vaccinated, insusceptible, dead unvaccinated, postponed by medical certificate, removed to district of which the vaccination officer has been apprised, removed and not found; after allowing for all those headings there were 400 not accounted for?—Yes.

13,309. And although then there were 132 prosecutions, still the number of prosecutions was considerably less than the number of cases not accounted for?—It was. I think you will find in Table C. that the whole of those 400 were summoned either within that year or the next; you will find that according to the Guardians' return.

13,310. There would be some of them summoned in the following year?—Yes. You will find that the two tables will not agree as to the number summoned, because the column relating to the number summoned in the Guardians' return refers only to births within the year specified, whereas the prosecutions will often relate to the children born in other years. That accounts for the difference in numbers in the two tables, that is Table C. of the Guardians and the summary of magisterial proceedings.

13,311. Substantially at that time prosecutions were being instituted against all those who were known to have violated the law?—They were; none escaped.

13,312. Then in 1881 the table shows 491 cases not accounted for, and in that year there were 1,154 cases summoned?—Yes; that would include arrears of the previous year.

13,313. Notwithstanding that in 1882 the number unaccounted for rose to 816?—It did.

13,314. So that the large increase in the number of prosecutions obviously did not lead to an increase in the amount of vaccination?—Rather to a decrease: the

vaccinations fell from 2,948 in 1881 in 1882, to 2,660 a fall of nearly 300.

13,315. With an increased number of births to the extent of 143?—Yes.

13,316. Then in 1881 there were 657 who were fined; in 1882, 918 were proceeded against and 691 fined; in 1883, the number unaccounted for rose notwithstanding that from 816 to 1,906?—It did; and the successfully vaccinated fell in the same year from 2,660 in 1882 to 1,732 in 1883.

13,317. In those years, 1881 and 1882, the Act was being enforced by prosecution?—It was.

13,318. Have you any suggestion to make with reference to the cause of that great drop in vaccinations from 1882 to 1883; was there a great agitation against vaccination then proceeding?—Yes, I can account for that. A league was established in Leicester in 1869; but in 1881 it put forth very great efforts, and as the result of those efforts the number of vaccinations rapidly declined.

13,319. The fall was not very great from 1881 to 1882; there seems to have been a much more marked fall from 1882 to 1883?—The efforts were continuous right down to 1883 and on to 1886.

13,320. Then in 1883 there was a resolution carried in the first instance against prosecutions?—There was; and also an amendment moved to a resolution and carried.

13,321. Then in October of the same year a resolution was carried authorising prosecutions?—Yes, that resolution was carried by the casting vote of the chairman.

13,322. And at a later discussion on the 27th of November of the same year the renewal of prosecutions was once more affirmed?—Yes; it was.

13,323. I suppose that those circumstances, the opposition to the prosecutions, and the amendment first carried, account for the large falling off in the number of the prosecutions in 1883?—Yes, I think that would be the case.

13,324. Because of course the defaulters were a very greatly increased number, and naturally there would have been more prosecutions if the old policy had been continued?—That is so; the defaulters have largely increased; but during the continuance of the Board during the three years of its existence, as I propose to show later on, the prosecutions remained in abeyance for about 18 months from various causes.

13,325. But in 1883, notwithstanding the temporary suspension of the prosecutions, there were in all 515 prosecutions and 385 persons fined?—Yes, I think that is so.

13,326. Then in 1884 the number of cases vaccinated in relation to the births was very nearly the same as in 1883?—Yes.

13,327. The number unaccounted for falling somewhat?—Yes, the two years do not differ materially in number.

13,328. But there were 1,732 successful vaccinations out of 4,819 births in the former year, and 1,700 out of 4,849 births in the latter year; the number of births and the number of vaccinations was approximately the same in each case?—Yes, approximately the same; but you will find that the variation in the figures for that year is accounted for partly by the increase in the number of cases which had removed and were not found.

13,329. And also (I do not know whether it arose from any special cause) I observe a large increase in this year, 1884, in the number of "dead unvaccinated"; the "dead unvaccinated" increased by 200 that year, which accounts for almost the whole of the difference in the "unaccounted for"?—That is accounted for in this way; it does not necessarily mean that a larger number died before the age of vaccination, but it means that the Vaccination Officer had fallen so far into arrears with his work that before the service of notice upon the parents the children had died. In the earlier years, when he had fewer notices to serve, he served them earlier in their life, so that fewer children were reported.

13,330. May we take it that some of them may possibly have died the previous year?—No, not the previous year; each line of the table refers to the births of each year. It simply means that at this time, 1884, he visited the parents at a later date, and consequently that the children had died in the meantime from some cause or other.



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13,331. Then "died unvaccinated" means before the visit of the Vaccination Officer?—It does; it does not necessarily mean that they had died, because they were unvaccinated.

13,332. (*Dr. Collins.*) And it does not necessarily mean that they must have died before the 31st of December of that year?—Not necessarily; the returns are corrected periodically even after the year has expired; they are made up to the 7th of February and the 7th of August of each year, and even, I believe, at subsequent dates.

13,333. (*Chairman.*) Then, going back to the year 1883, it was arranged, I understand, that, owing to the approach of Christmas, the prosecutions should not be proceeded with at once, notwithstanding the decision of the Board to renew prosecutions?—That was so.

13,334. Then in 1884 the prosecutions were continued; there were 529 that year with 372 persons fined; how was it that there were no more than 529 that year?—The fluctuations, or apparent fluctuations, would be caused by the circumstance that the Vaccination Officer would return a certain number of defaulters and would practically receive instructions upon that number; then, his work having fallen into arrear, he would deliver the notices and would not be able to report a further number of defaulters until the whole of those notices had been delivered and the time stated in them had expired; that would account for the fluctuations in the number of prosecutions.

13,335. It did not arise from any change of policy, the prosecutions were going on?—They went on to 1886, with the exception that during the existence of that Board they did remain in abeyance for eighteen months from some cause or another.

13,336. Then in 1885 the number of successful vaccinations diminished again by something over 300?—324.

13,337. That was out of a somewhat smaller number of births?—A decrease of the latter of over 100.

13,338. It was, however, a comparative reduction notwithstanding that?—Yes, it was a reduction.

13,339. And the number "unaccounted for" rose to 2,747?—Yes.

13,340. I notice that in that year there is a greatly diminished number of "cases removed and not found"?—That is so.

13,341. Do you know what is the explanation of that?—I think that is explained by this: that at the end of 1883 that resolution was passed authorising prosecutions, and in consequence of that a large number of people removed about from one house to another in order to evade the prosecutions.

13,342. That accounts for the large number in 1884, you mean?—Yes; but as time proceeded and we got near to the ensuing election for 1886, although the policy of the Board remained the same for a considerable portion of the time, there were no prosecutions, and the people did not move about as much as in the previous year, 1884.

13,343. But in 1885 there were 1,265 prosecutions; in 1886 the number of cases removed diminished to 91?—Many of those prosecutions in 1885 would be the prosecution of parents whose children were born in 1884 and, possibly 1883.

13,344. But I am only looking at the effect of the increase of prosecutions upon the number of those removed. The number of removals with this great number of prosecutions diminished and did not increase?—But the preceding year must be taken into account somewhat on that point.

13,345. In 1885 there were 1,265 prosecutions and 556 persons fined, but in 1886, the following year, notwithstanding that, the amount of vaccinations seems still further to have largely diminished?—Yes, that is accounted for by the return of the new Board, which decided immediately upon its election to stay prosecutions.

13,346. What date would that be?—The resolution I think you will find was moved on May 4th, 1886, and as a matter of fact the prosecutions were not carried out on account of the approaching elections. The majority on the Board who favoured the prosecutions remained quiet, and the number ordered at the end of 1885 were left practically to exhaust themselves.

13,347. In 1886 the number of vaccinations fell from 1,376 to 598 with a distinct increase in the number of

births, the births increasing from 4,690 to 4,874, whilst the number of successful vaccinations diminished by more than half?—That is so.

13,348. Then in 1886 there were 467 proceeded against; those I gather would be all in the early part of the year?—They continued till about August and September, because the prosecutions which had been authorised by the previous Board were allowed to run out; no new prosecutions were commenced after the vote of May 4th, 1886.

13,349. Then in 1887 the number of vaccinations further decreased from 598 to 322, but that was out of a somewhat diminished number of births, the births having gone down from 4,874 to 4,693: there was not so great a diminution from 1886-87 as there was to 1885-86?—That would not be possible, because there was a greater diminution from 1885 to 1886 than the whole of the vaccinations of the latter year.

13,350. In 1887 there were three prosecutions but no person fined; the cases were all dismissed?—Those would be adjournments from various causes.

13,351. And there have been none since that date?—There have been no prosecutions authorised by the Board at all since 1886. A vote was taken by the Board in 1886 to discontinue prosecutions; as a matter of fact no prosecutions were ordered in the year 1886, and any which took place in 1886 were the result of the vote of the previous year authorising them.

13,352. In 1888 the number of cases of successful vaccination had diminished from 322 in the previous year to 219, the number of births being somewhat higher?—Yes, and the births were 122 higher.

13,353. But there appear to have been more cases of "removed and not found," so that the "unaccounted for" were slightly less in 1888 than in 1887?—They were.

13,354. There was no very great difference between those two years in the number unaccounted for?—No material difference.

13,355. Have you the figures for 1889 and 1890?—I have. In 1889 there were 4,786 births, and 126 "successful vaccinations," which number has since been increased to 127, and four "insusceptible"; none in the next column; 765 "dead unvaccinated"; one "removed to districts the Vaccination Officer of which has been apprised"; 253 "cases removed, and not found"; and 3,637 "unaccounted for."

13,356. That is nearly the same number "unaccounted for" as in 1888?—Yes, practically the same; and the births are fewer.

13,357. Will you give us the figures for 1890?—In 1890 we have only the first half-year; the year is not complete; the returns are always made out six months subsequent to the expiration of the year, and we shall not have the complete returns for 1890 until August; but during the first half of 1890 there have been 60 vaccinations.

13,358. That is as nearly as possible the same as for 1889?—It is practically the same as for 1889 in proportion. Then, referring to the column of cases "removed and not found," the smallness of the number compared with those "unaccounted for" in later years would be partly accounted for by this: that the Vaccination Officer is so far in arrear with his work that he did not visit them within the period when this return was made out.

13,359. One would have expected to find after that time the number increasing in the following year largely?—Not in this return, because each year's return is for that year alone; and the return is made up six months after the expiration of the year, so that after the expiration of the six months you would get no subsequent return in this print. The returns for 1889 would be furnished to the Local Government Board in 1890; and, again, those would be corrected in February 1891; but this printed table only refers to the return which would be presented in August 1890.

13,360. So that they may have been in some subsequent return to the Local Government Board put down under the heading "removed to other districts"?—In a subsequent return to the Local Government Board that would be so.

13,361. So that the variations here would arise from his getting more in arrear with his work?—That would



be so in that particular column: slight variations would occur in the column headed "successfully vaccinated," after the time when the return had been sent to the Local Government Board in August 1890, the number furnished for 1889 was 126, but that number has subsequently risen to 127.

13,362. Are there any other observations which you wish to make upon these statistics?—Not at the present time. The tables before you are taken from the official returns which have been sent to the Local Government Board and are an exact copy of them. There is one point which would interest the Commission which I think the Clerk to the Guardians could answer, if you would allow him to do so, that is to say, in respect to the subsequent vaccinations. I think it is a point which should be cleared up at this moment. Some question has been raised in regard to the column headed "successfully vaccinated," as to whether those numbers which occur in the later years; 1887, 322 successful vaccinations; 1888, 219, and in 1889, 126; are not largely increased subsequently, that is to say, by vaccinations which occur after this return is made out. I think the Clerk is prepared to answer that question, and I think it would save considerable time later on if he were allowed to do so at this moment.

13,363. (*To Mr. Chamberlain.*) Are the figures which appear under the head of "successfully vaccinated," which are put side by side with the births in each year, subsequently increased by additional vaccinations?—In 1887 the number of successfully vaccinated was 322 out of the number of births for that year, and up to yesterday that number has been increased to 344. In the 1888 return the number appearing as "successfully vaccinated" is 219, which has now increased up to date to 224, and in 1889 from 126 to 127 a very small addition.

13,364. Do the numbers in each of those years under the column headed "successfully vaccinated" represent the vaccinations of the children whose births are stated as registered in the preceding column?—Yes.

13,365. It is not the total number of successful vaccinations?—No; it only relates to children whose births are registered in that particular year.

13,366. Is there any other point connected with the statistics which are alluded to in the statement you have read which you would desire to observe upon to the Commission?—No.

13,367. (*To Mr. Biggs.*) Can you suggest any explanation of the great variations in the proportion which the number vaccinated by the Public Vaccinator bears to the total vaccinations. I observe, for example, that in 1883 there were 1,732 successful vaccinations, and 1,300 of them by the Public Vaccinator; in the next year there were 1,700 vaccinations, while the number vaccinated by the Public Vaccinator was only 776; in the next year, with the smaller number of 1,376, 1,017 were vaccinated by the Public Vaccinator; do you know what the explanation of those variations is?—I have noticed those considerable variations; the only way in which I can account for them is this: that those vaccinated by private practitioners would be the children of parents in better circumstances in life. It would frequently happen that a surgeon having vaccinated a number of children would keep the certificates back so as to send in a batch of them all together; that would account for the variations.

13,368. That they were not sent in in the same year?—That they were kept back until after these returns were made up and sent in to the registrar in batches collected during three or six months, as the case might be. I do not know any other explanation that can be offered for that variation.

13,369. (*Mr. Picton to Mr. Chamberlain.*) How were the figures headed "successfully vaccinated" obtained?—From the register kept by the Vaccination Officer. The certificates are all there to check the register.

13,370. Who supplies them to him?—The parents send in the certificates.

13,371. That certificate is given by the vaccinator?—Yes, at the time when a birth is registered a form is issued to the parent which when the child is vaccinated is filled up by the medical practitioner and returned to the Vaccination Officer.

13,372. That the vaccination has been satisfactory to him?—Yes, or that the child is insusceptible, or the operation postponed, as the case may be.

13,373. (*Chairman to Mr. Biggs.*) I did not quite understand your explanation as to the variations in the figures returned as public vaccinations compared to the total vaccinations, because it depends, as far as I understand you, upon the action of the private vaccinators in keeping the certificates back and sending them in in batches; but how would that affect the number in this column which is only the number vaccinated by the Public Vaccinators; not the proportion, but the number vaccinated by the Public Vaccinators?—We were speaking, as I understood, of the number vaccinated by private practitioners.

13,374. Only as taking them out of the total number. You see you have in the third column, both public and private together, giving roughly the same number of vaccinations in each year. Why should the Public Vaccinator have vaccinated 1,300 in 1883 as compared with 776 in 1884; it seems such an enormous difference, being only about half in the second year what it was in the first year, the total vaccinations in the two years being approximately the same?—I do not know of any other explanation excepting this, that possibly the parents would refrain from having their children vaccinated in 1884 to a larger extent than they did in 1885. What I mean by that is that it is possible that the 776 might be made up some time in the succeeding year in the way of those figures that the Clerk has just alluded to. There are other matters which will affect it, such as illness amongst the children; the number who died unvaccinated is very high for that year, 1884.

13,375. But you see again that in 1886, when there were 598 successful vaccinations, there were 559 vaccinated by the Public Vaccinators, being very nearly the whole. Then if you look at the next year there were 322 vaccinated, while of those the Public Vaccinators only vaccinated 164?—The fall of public vaccinations in 1884 would be partly accounted for by the fact that the prosecutions to a certain extent ceased. They were revived at the close of 1884 and carried on rather sternly through 1885, which would cause a rise in the vaccinations for 1885.

13,376. But it is the proportion which the Public Vaccinators' vaccination bears to the total vaccination which appears to fluctuate so strangely?—The circumstance I have just named would account for the increase in the number of public vaccinations.

13,377. Would it when the number of vaccinations went down and did not increase?—I think it would.

13,378. In the later year, 1886–7, there were no prosecutions, I think?—None, excepting proceedings arising from instructions of the Guardians in 1885.

13,379. Then you see of the 598 cases vaccinated in 1886, 559 were vaccinated by the Public Vaccinators; in 1887 there were 322 vaccinated of which only 164 were by the Public Vaccinators. The next year 219 were vaccinated of whom only 59 were by the Public Vaccinators?—Those figures show the large extent to which vaccination has been abandoned by the middle and the upper classes in Leicester. The total number of vaccinations include the whole of private and public vaccinations.

13,380. Can you account for this: that in 1886, when there were no prosecutions any more than in 1887 and 1888, there seemed to have been almost no vaccinations by private practitioners compared with the Public Vaccinators; whereas in the following years the private practitioners seem to have done so much more?—Proportionately.

13,381. Both proportionately and actually. In 1886 there are a very small number vaccinated by private vaccinators as compared with those vaccinated by Public Vaccinators. In 1887, however, the Public Vaccinators only vaccinated about half, and in 1888 they only vaccinated about a fourth of the total?—That is fully accounted for by the fact that the parents generally of all classes prefer to have their children vaccinated later in life; and immediately upon the election of the Board in 1886, when they decided not to prosecute, those who engaged private practitioners would certainly decide to have their children vaccinated later, and that would cause an amount of drop in the private vaccinations during the year 1886.

13,382. (*Mr. Picton.*) Do you mean that people of all classes who wish to have their children vaccinated, have resorted more to private practitioners, because they desire to have them vaccinated later in life?—I do not mean that; I mean that those who do resort to private

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practitioners prefer to have them vaccinated later in life, and as soon as the pressure of the law was removed in 1886, we see the result in the diminished number of vaccinations which might possibly take place the year after.

13,383. (*Dr. Collins.*) I suppose the enforcement of

Messrs. Biggs and Chamberlain withdrew.

Mr. J. Leeson.

Mr. JOSEPH LEESON examined.

13,385. (*Chairman.*) You are a shoe manufacturer, residing in Highfield Street, Leicester?—Yes.

13,386. You were elected member of the Board of Guardians in Leicester in 1883, and at subsequent elections down to the present time?—Yes.

13,387. You were chairman of the Board from April 1889 to April 1890?—Yes.

13,388. Up to the year 1871 were you a thorough believer in vaccination?—Yes.

13,389. Your three elder children were all vaccinated?—Yes, that is so.

13,390. What led you to change your view with reference to vaccination?—The illness of my fourth child after vaccination.

13,391. She was vaccinated by Dr. Denton, one of the Public Vaccinators?—She was. I was only having 1*l*. a week at the time so that I could not afford to pay for a private practitioner; that accounts for its being done by the Public Vaccinator.

13,392. What ensued upon the vaccination of that child?—An eruption upon the vaccination spot; then upon the bend of the arm, and her head was one cake of scab.

13,393. Who attended her medically?—I believe Dr. Lankester; we had several doctors to see her; but we could not stop the discharge from the head until some neighbour got us a bottle of ointment and rubbed it in, and that seemed to heal it a little.

13,394. How long did this go on?—I should think it was like that for two or three years.

13,395. Did the doctor tell you what it was the child was suffering from?—He said it was the result of vaccination.

13,396. But did he tell you what the disease was?—No.

13,397. He did not say that it was erysipelas or eczema or anything of that sort?—He did not say that.

13,398. You are not sure that Dr. Lankester attended the child?—I am sure he did some portion of the time.

13,399. Who else attended her?—Dr. Clarke and Dr. Lakin. I am not sure who else we asked to come, but we always had a properly qualified doctor.

13,400. You said that this condition went on for two or three years; did the child improve after that?—The scabs dried up, and the hair began to grow better, but there were breakings out at the arm which used to come on almost every year, and sometimes under the bend of the knee.

13,401. She died at the age of 12?—Yes, she did.

13,402. Have you the certificate of death?—I have it here. She died in the year 1883.

13,403. The cause of death was certified by Dr. Lankester?—Yes, we had him in at her last illness; he had not attended her through her life regularly.

13,404. The cause of death is certified as cardiac disease, anasarca?—Yes. When she got better of the scab it left rheumatics; then that left heart disease, and the heart disease dropsy; so that the poor thing was ill all her life.

The witness withdrew.

Mr.  
W. Barfoot.

Mr. WILLIAM BARFOOT examined.

13,423. (*Chairman.*) You reside at Welford Place, Leicester?—Yes.

13,424. And you are a merchant and manufacturer?—Yes.

the law would tend to increase the proportion operated upon by the Public Vaccinators?—Yes.

13,384. The class that would be most influenced would be the class who would mostly resort to the Public Vaccinators?—Yes, they would; that rule would not apply absolutely, but it would generally speaking.

13,405. You have since that time taken an active part in opposition to vaccination?—Yes.

13,406. And presided over meetings which have been held against the law of compulsory vaccination?—Yes.

13,407. Have you known many who have suffered imprisonment and distress of goods?—Yes.

13,408. Have they been numbered amongst the intelligent and respectable of the working classes?—They have; those that I have known.

13,409. I believe you have upon some occasions paid the fines of some of those in your employment who were too poor to pay them themselves?—Yes, I have.

13,410. Have any of those in your employment suffered imprisonment?—One, William Ball, had seven or fourteen days, I am not sure which; and very ill he was after it: he has never been well since.

13,411. (*Mr. Picton.*) Was he condemned to hard labour?—I really could not answer that question; I believe he is coming before the Commission.

13,412. (*Chairman.*) When you were returned as a Guardian in 1883 it was as an opponent to compulsory vaccination?—It was; no one would stand a chance in that district unless he was opposed to it.

13,413. (*Mr. Picton.*) Do you at all attribute the death of your child to the injuries caused by vaccination?—I certainly do.

13,414. Have you any reason for that?—The reason is that all my other children have been well when they have been vaccinated and so was this one, but directly afterwards this illness broke out.

13,415. You say Dr. Lankester attended her in her last illness?—Yes.

13,416. Did you ask him anything about the connection of the disease with the vaccination?—Not then; I should suppose it would have passed from his mind, it having been so many years previously.

13,417. Did any other doctor give an opinion upon the subject?—Yes, at the time she was ill, not afterwards.

13,418. (*Dr. Collins.*) As chairman of the Board of Guardians I suppose you are acquainted with the procedure under the Vaccination Act?—Yes.

13,419. Has it been the practice in Leicester to enforce more than one penalty at any time?—I do not think it has; I think I may say certainly not.

13,420. I find that in the return to the House of Commons of the 24th of March 1890 there were 3,249 persons fined in the borough of Leicester during the preceding ten years, and it is stated that none were fined more than once in respect of any one child?—I believe that is the fact.

13,421. So that the revolt against the law in Leicester has practically been against the one penalty system?—Yes, it has; they do not believe in being fined at all.

13,422. Supposing the law were altered so as to make only one penalty recoverable, would that, do you think, in any way diminish the opposition of Leicester?—Certainly not.

13,425. And you have been a member of the Corporation of Leicester for about 23 years?—24 years.

13,426. You were also a member of the Board of Guardians from 1863 to 1866?—Yes, I was.



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13,427. You were Mayor of the borough for the year beginning November 1875?—Yes.

13,428. During the time of your mayoralty I believe you adjudicated upon 47 cases under the Vaccination Act?—That number has been taken from the police books, and I believe it is correct.

13,429. Near the close of your year of office did the magistrates decide to reduce the fine upon vaccination defaulters from 20s., which had been usually imposed, to 10s.?—I believe that was my proposition.

13,430. In 1880 you were appointed a Justice of the Peace for the borough?—Yes.

13,431. And since that time you have exercised jurisdiction in 112 cases of vaccination default?—Those figures also have been taken from the police books, and I believe that number is accurate.

13,432. Did you find in various cases that the persons charged with default were determined not to have their children vaccinated?—Yes, absolutely determined; many of them said they would rather go to prison than pay the fine.

13,433. They gave as their reason, I believe, instances of injuries following vaccination in their own families?—That has been alleged several times when I have been on the Bench, and when they have done so, if we could, we have allowed them to go without payment of fine.

13,434. You, I believe, are not opposed to vaccination yourself?—No.

13,435. But you are opposed to compelling parents who object to vaccinate their children?—I am.

13,436. (*Mr. Whitbread.*) When did the opposition to vaccination originate in Leicester?—I am not able to say when.

13,437. Do you know anything of the history of the growth of the feeling there?—No, I cannot say that I do.

13,438. How long do you remember Leicester?—All my life; I was born there.

The witness withdrew.

Mr. WILLIAM KEMPSON examined.

13,448. (*Chairman.*) You reside at Southfields, Leicester?—Yes.

13,449. And you have been a member of the Corporation since 1865?—Yes.

13,450. You were elected Alderman in 1873 and served as Mayor from the November of that year?—Yes.

13,451. In 1879 you were appointed a Justice of the Peace, were you not?—Yes.

13,452. Last year, I believe, you were again appointed Mayor?—Yes.

13,453. I believe whilst you were chief magistrate, in 1873-74, you adjudicated upon some vaccination cases?—Yes, a certain number, but not very many, I think.

13,454. Since that time you have adjudicated, I believe, upon 372 cases?—Yes.

13,455. You are yourself a believer in the efficacy of vaccination?—I am.

13,456. Are you opposed to the enforcement of compulsory vaccination?—Yes, I am, decidedly; and more so, perhaps, in Leicester than I should be in any other town. The feeling is very strong in Leicester; almost enough to set class against class. I am decidedly opposed to it in Leicester.

13,457. On account of the strong feeling which many have that they ought not to be forced to vaccinate their children?—Yes. I have also this feeling, that I do not like anything imposed on a parent which he believes would injure his child.

13,458. (*Mr. Whitbread.*) Could you give me any account of the rise and progress of the feeling against vaccination in Leicester?—I cannot exactly go back to certain years, but Booth was one of the great agitators against it. The feeling grew, I think, gradually; it did not become so intense, I think, until later years, but in later years it has been very strong.

13,459. About what time was Booth?—I think about 18 or 20 years ago.

13,439. Was the feeling against vaccination as strong when you were, say, 20 years old as it is now?—No, I believe not; I believe this feeling against vaccination must have commenced 20 or 30 years ago, as far as my recollection serves me.

13,440. You do not know that there was any one individual who was a great propagator of the anti-vaccination doctrine?—There was an old friend of mine of the name of Dudgeon, with whom I used to have a great many discussions, who died during the last two or three years, who was a great opponent of vaccination; he was a literary man.

13,441. (*Mr. Picton.*) Are you thoroughly acquainted with the feeling of the town?—Quite.

13,442. At the present time is the feeling stronger or weaker than it was?—I believe it is stronger than it used to be.

13,443. What means, do you think, would be successful in enforcing vaccination in Leicester?—From what I have seen of those who have been brought before the magistrates, and from what I can gather of the talk about it, I do not think it is possible to compel the people to have their children vaccinated; the determination is certainly very strong against it.

13,444. What is your experience as to the moral character and reputation of the recalcitrants who have been brought before you?—They appeared to be most intelligent people for the most part; of course there were some that you would think would not be quite so strong as others, but still, generally speaking, they were very intelligent people.

13,445. Were they generally people of good character?—Yes, I think so.

13,446. (*Dr. Collins.*) Have any of them been brought before you under any other charges?—Not to my knowledge; generally speaking, they were very quiet, orderly people.

13,447. It has never been your practice to enforce more than one penalty for one case of disobedience?—Only one for the same child.

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W. Kempson.

13,460. What was his position? Was he a medical man, or what?—He was a working man. I think he was in some small trade; at that time he was not a man of any social importance.

13,461. Did he start the agitation against vaccination, do you know, from any special circumstances which he had seen in his own family?—I do not know his reason. I am only now speaking from impression, not from any certainty. I think there were compulsory proceedings taken as to the vaccination of his children; that is my impression, but I cannot say for certain.

13,462. He was imprisoned?—Yes.

13,463. He came out a martyr and became an apostle, I presume?—I think that gave the public a strong feeling against it.

13,464. Was there, to your recollection, any neglect on the part of the Public Vaccinators which gave rise to the feeling against vaccination?—I think not. I think there were two or three cases, perhaps, named; there were a few complaints made, speaking from recollection, but I do not think there was any general feeling that the vaccination was not fairly done.

13,465. Is Booth alive now?—Yes; the last year or two he has not been so active an opponent as he was.

13,466. Is the feeling as strong in the villages which surround Leicester as it is in the town?—I cannot speak to that; I do not know.

13,467. (*Mr. Picton.*) Did you formerly approve of compulsion?—Yes, I did.

13,468. And you have imposed penalties for it?—Yes.

13,469. Did you think at the time that the rigorous enforcement of the law would overcome the opposition?—I was hoping that it would. I thought that the opposition at the time was more amongst the agitators than amongst the people.



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13,470. May I ask what date you are referring to now?—I should think about 12 years back.

13,471. What changed your opinion then?—The experience that I had.

13,472. (*Dr. Collins.*) I think you said that at one time you thought the opposition was more amongst agitators than amongst the people?—Yes, I did.

13,473. Have you changed that opinion?—I have, decidedly.

13,474. And that the opposition is not the result of agitation now; is that your opinion?—It is. It is the general feeling, I think, now.

13,475. (*Sir William Savory.*) Did you mean that it was in the first instance due to agitators?—I thought it was due to agitators in the first instance.

13,476. And you still think it was due to agitators?—In the first instance, but not at the present time.

13,477. (*Sir Charles Dalrymple.*) Has it never occurred to those in charge of the vaccination at Leicester to inquire as to the origin of the exceptional feeling against vaccination in the town?—There has never been any public inquiry by the authorities there.

13,478. Is there no prevalent impression as to the origin of the exceptional state of things there?—I think most take the same view which I took at first, that there

were a few agitators who took a very active part, and gradually the feeling grew with the agitation.

13,479. You mentioned Booth, were there any other persons who engaged in that special crusade against vaccination?—There is no one else that I recollect now; he was the most prominent man by far.

13,480. For how long a period has the question come up very much at municipal elections?—For the last 10 or 12 years, I should imagine.

13,481. (*Mr. Whitbread.*) Whatever the cause of it, even if it were due to agitation 20 years ago, there has been no reaction in that feeling up to the present time?—There has not; it has certainly increased, I think, from that time to the present.

13,482. (*Sir Charles Dalrymple.*) Do you think the feeling against vaccination arose more from agitation against vaccination than from any prevailing knowledge of injuries caused by it?—The persons who took an active part in it brought forward a number of cases stating that certain children and certain persons had suffered, but I think it was a public declaration by certain persons that certain children and families had suffered by it rather than any great number of cases which came before the magistrates. I think the great number of those who came up did not speak from personal experience; some did, but I think the greater number had a dread of injury arising from vaccination rather than having suffered from it.

The witness withdrew.

r. I. Hart.

Mr. ISRAEL HART examined.

13,483. (*Chairman.*) You reside at Ashleigh Knighton?—Yes.

13,484. In 1874 you became a member of the Corporation, did you not?—Yes.

13,485. You represent one of the largest wards in the borough?—Yes.

13,486. In November 1884 were you elected Mayor, and re-elected the following year?—Yes.

13,487. And again in 1886?—Yes.

13,488. During the three years you were chief magistrate a large number of vaccination prosecutions took place?—Yes.

13,489. But you yourself only had to adjudicate upon a small number?—Yes.

13,490. When the prosecutions were at their height a deputation from the Board of Guardians waited upon the magistrates to urge them to reduce the fines?—Yes.

13,491. They were at that time 10s.; that was the fine customarily imposed?—Yes.

13,492. A special meeting of the magistrates was summoned to consider the matter?—Yes.

13,493. You do not mean that that 10s. was the maximum fine imposed by the law?—No, but that it was the maximum fine we imposed.

13,494. You were divided at the meeting as to what should be done, and the matter was left as it was?—Yes.

13,495. Was there after that a considerable amount of agitation in the town at the time of the elections both for the Town Council and for the Board of Guardians?—Yes.

13,496. In March 1885 there was held at Leicester a national demonstration against the Act?—Yes.

13,497. Were there a very large number of persons present at the demonstration?—A very large number; the whole market-place was filled.

13,498. The number attending was so large, was it not, as to cause you some anxiety as to the public order?—It did, a great deal of anxiety.

13,499. Are you yourself opposed to compulsory vaccination?—Yes, to compulsory vaccination.

13,500. Would you tell the Commission on what ground?—These people seem to object to it from principle, conscientiously; it seems a great hardship to many of them; and also the result of what has been done in Leicester has convinced me to a great extent that this disease can be dealt with without these compulsory laws. I have no doubt you have heard that we

have adopted such measures in the district that practically the disease is stamped out.

13,501. Do you think on the latter point that measures of that description could be carried out effectually if you had anything like an epidemic in Leicester?—The conditions are not such that we are likely to have an epidemic; if there is a case of fever it is dealt with directly, and there is no fear of an epidemic; epidemics, as we know, arise from contagion, and it is difficult for contagion to take place as contagious disease is dealt with at Leicester.

13,502. (*Sir William Savory.*) Your sanitary measures are effective, I presume, not only against small-pox, but against all forms of infectious disease?—All forms of contagious disease.

13,503. Your observations would apply to all forms of infectious disease?—All forms of contagious disease.

13,504. So that, practically, Leicester is quite safe from the spread of any sort of infection?—I should say the chances of contagious disease spreading are very much lessened.

13,505. Aye, but how much lessened?—So far, of course, that not coming into contact with contagion you must lessen the chance of its spreading.

13,506. You think that the measures you take are effective against all forms of disease?—Yes, I think that the measures we have adopted go far in that direction. No doubt they can be improved upon.

13,507. That not only compulsory vaccination but vaccination altogether is a useless proceeding?—I do not say that; I only say that with the measures carried out at Leicester it appears unnecessary.

13,508. At Leicester it would be useless; in other towns not so highly favoured as Leicester it would be useful, but in Leicester it would be practically useless; is that your opinion?—We can only judge from what has been the case at Leicester. There has been very little small-pox at Leicester for many years past.

13,509. But it has been the habit of small-pox, has it not, to break out at times in epidemics?—Yes, it has been.

13,510. And you do not think that could be the case in Leicester?—I cannot speak for what might happen, but we do not apprehend it.

13,511. (*Sir James Paget.*) Do you isolate cases of scarlet fever?—Yes.

13,512. Have you had a considerable number of cases of scarlet fever lately?—Yes, there have been a good many cases of scarlet fever, I believe, lately.



13,513. Has there been much typhoid?—No, I do not think there has been much typhoid.

13,514. Do you isolate cases of typhoid fever?—No, we do not; that is not considered a contagious disease, but only an infectious disease.

13,515. And diphtheria?—We do not isolate for diphtheria.

13,516. Have you had many cases of that?—I cannot answer that question, because I am not a member of the Sanitary Committee, so that it does not come commonly before me; but I do not think that there have been very many cases.

13,517. Therefore we may take it that diphtheria has not shown much disposition to spread in Leicester?—No, it has not.

13,518. But you have not been able yourself to count the cases?—I have not.

13,519. (*Mr. Whitbread.*) Do you personally believe in the good effects of vaccination?—I believe in it so far that I have been vaccinated myself, and I have had my children vaccinated.

13,520. You believe in the efficacy of vaccination, but you think that at Leicester you have found a more excellent way of dealing with small-pox?—It appears so.

13,521. Which renders it unnecessary?—I think in the case of Leicester people's minds have been poisoned against vaccination by the imperfect manner in which, I suppose, many of the operations have been performed, and the after consequences of vaccination. I think that is the serious part of the vaccination; it is owing to that that the people's minds have been poisoned against it.

13,522. Do you think that in Leicester especially you have careless and bad vaccination by the Public Vaccinators?—I should not like to say that, but I have heard of numerous instances from persons of good authority where there have been very serious after consequences from vaccination.

13,523. When you imposed fines in Leicester did the fine practically fall upon the individual fined, or was there any association which always paid it?—I do not think there was any association; the expense fell upon the poor people who were summoned.

13,524. Have you had any sale?—Yes.

13,525. Was that a real sale or a mock sale?—As far as my knowledge goes it was a real sale, but I have never been identified with these things; I have never adjudicated much upon cases of vaccination. I objected very much to adjudicate upon such during the three years of my mayoralty.

13,526. (*Mr. Pictou.*) When you spoke of people's minds being poisoned against vaccination owing to the imperfect vaccination, were you aware that the Public Vaccinators in Leicester have from time to time received premiums as a reward for excellent vaccination?—I was not aware of that.

13,527. Let me ask you to go back to the time when you first became a member of the Corporation, that is in 1874; was the question a prominent one then?—Yes, and always has been for the last 20 years.

13,528. So early as 1874?—I should think it has been prominent for the last 20 years.

13,529. You remember there was a great epidemic of small-pox in 1872 in Leicester; had the feeling against vaccination already grown so strong in 1874?—I think it had.

13,530. What was the idea generally entertained amongst intelligent people of the middle class about the agitation at that time; was it believed to be owing to the efforts of one man?—No, I believe not; I believe it was the feeling generally.

13,531. Was it generally believed amongst gentlemen like yourself that the agitation would die out at that time?—I do not think it was.

13,532. But you endeavoured to enforce the law?—Yes, the law was enforced no doubt.

13,533. Did you think that a steady enforcement of the law would stamp out the agitation?—One could hardly think from the tone and feeling of the people that it would.

13,534. During your three years' mayoralty there appear to have been a very large number of prosecutions?—I believe there were.

13,535. And I presume the magistrates had consultations upon the subject?—Yes.

13,536. What was the feeling amongst them; did they or did they not expect that they would be able to put down the agitation?—The feeling was divided.

13,537. Some expected that they would and some did not?—Yes.

13,538. Was it the experience you had during the time of your mayoralty which turned your mind against compulsion?—I do not think so.

13,539. Had you been against compulsion before?—Always; I was always against interfering with the liberty of the subject.

13,540. Then you were an unwilling enforcer of the law?—Yes.

13,541. Has there been amongst the magistrates of Leicester generally an earnest desire to enforce the law?—Opinion has been divided with regard to the vaccination law. I think a great many have unwillingly enforced the law, they felt bound to do so; the only relief was that after having once convicted, those cases would not come before them again; that was the only consolation they had in the matter.

13,542. You said that at the time of the national demonstration you had some uneasiness about the public peace?—Yes.

13,543. What would be your feeling if there were peremptory orders issued that everybody was to vaccinate his children in Leicester now?—I do not think they could be carried out.

13,544. (*Dr. Collins.*) You appoint Public Vaccinators in Leicester, do you not?—Yes.

13,545. And they are efficient, qualified men, I suppose?—No doubt, else they would not be appointed.

13,546. So that there is ample provision made for those who wish to be vaccinated being operated upon?—There is.

13,547. It has not been the practice to inflict more than one fine in Leicester, has it?—Not during recent years; not during my mayoralty.

13,548. (*Sir Edwin Galsworthy.*) Is your objection to the vaccination itself or to the fact of its being compulsory?—To the fact of its being compulsory.

13,549. You do not object to vaccination?—I do not object to vaccination.

13,550. When was the last child of yours vaccinated?—It must be two years since.

13,551. How many children may you have had vaccinated?—Seven.

13,552. (*Sir Charles Dalrymple.*) When was the demonstration to which you refer?—In 1885 I think it was.

13,553. Did that demonstration follow upon any special active agitation upon the subject?—No, I think not; it was a gathering of anti-vaccinators from different parts of the country. I did not know anything about it till I saw the preparations being made for it.

13,554. Had the people's minds been, to use your expression, poisoned particularly against vaccination at that time?—No, I think not.

13,555. You yourself believe in vaccination and you take care to have it in your own family; but, as I understand you, you yield to the public feeling in the town at large?—Yes.

13,556. I suppose the magistrates in Leicester, whatever their opinion, would scarcely venture to advocate vaccination?—Yes, some would.

13,557. Do any still?—Yes, I think so.

13,558. Have you ever heard of a town like Leicester which practically had a predominant feeling against vaccination and dispensed with it?—I know from reports that Bewdley is a town which is very much against it, and also Keighley.

13,559. Did Leicester suffer very much in the year of the epidemic of 1872?—I can hardly charge my memory as to the extent to which it suffered. I believe there were several cases.

13,560. Are you without apprehension as to the position of the town in view of any future outbreak?—As I have told the noble Chairman, we seem, from what we can judge, to have stamped out this particular disease by the precautions which have been taken.

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13,561. I understand you have adopted a system of isolation; is it within your knowledge that when members of a family are isolated they are vaccinated to

protect them against all infection from the member of the family who may be infected?—I do not know that it is so; I never heard of it.

The witness withdrew.

Mr.  
C. Stretton.

Mr. CLEMENT STRETTON examined.

13,562. (*Chairman.*) You reside at Glen Magna, near Leicester?—Yes.

13,563. In 1868 you became a member of the Town Council?—Yes.

13,564. In 1877 you became Mayor?—Yes, I did.

13,565. And you were again elected Mayor in November 1878?—Yes.

13,566. And you were appointed a magistrate in 1879?—Yes.

13,567. Both whilst you were chief magistrate of the town, and, subsequently, as Justice of the Peace, you have adjudicated upon vaccination cases?—Yes, upon about 50 cases, I think.

13,568. About 50 during each period?—Yes.

13,569. Have you had before you cases of default in which you were satisfied that the default arose from conscientious objections?—Yes. More particularly on one occasion, when I had about 14 or 15 persons before me who were small shopkeepers and the better class of artisan; they each of them told me that they had conscientious objections to their children being vaccinated, and they gave me their reasons, stating that children who had been previously vaccinated had suffered from it, and that they objected to having it done again.

13,570. I believe you made some observations in 1884 from the Bench with reference to the character of the people who were thus summoned?—I did.

13,571. Since then you have not sat upon any vaccination cases?—No.

13,572. You are, I gather from that, opposed to the compulsory enforcement of vaccination?—Yes. I am a solicitor and, therefore, it would be part of my duty to advise everyone I come in contact with, to obey the law. It does appear to me that we are compelling honest people to break this law by endeavouring to enforce it as against those people who have conscientious objections. I may say that I am not personally against vaccination.

13,573. But you are against compulsory vaccination?—I am against compulsory vaccination.

13,574. (*Mr. Whitbread.*) You, as a solicitor, would be possibly acquainted with the details of some of the cases where fines were inflicted; was it the fact that the fines ultimately fell upon the individual who was fined, or were they paid by their friends or some society?—In the cases which came before me I believe the people paid their own fines. There have been many cases in Leicester in which they have been paid by their friends or by some society, but in the cases that I refer to they were not assisted by any sort of professional agitator.

The witness withdrew.

Mr.  
J. T. Biggs.

Mr. JOHN THOMAS BIGGS examined.

13,586. (*Chairman.*) You are plumber and sanitary engineer, carrying on business at Waterloo Street, Leicester?—I am.

13,587. You directed your attention first to the subject of vaccination in 1869, I believe?—I did.

13,588. In what way was that?—My attention was drawn by my partner, Mr. Henry Matts, who told me that an Act of Parliament had been passed which he thought would bring him into trouble; he referred to the Vaccination Act of 1867; he said that he was opposed to vaccination, and that his opposition to the Act might possibly lead to his imprisonment.

13,589. You have yourself been vaccinated, I believe?—I have.

13,590. And you have also had small-pox?—I suffered slightly during the epidemic of 1872.

13,591. Did your brother also suffer?—None of my brothers or sisters suffered at that time.

13,592. Had one of them suffered some injury?—One suffered injury from vaccination.

13,575. I believe the thing has passed the stage of agitation in Leicester now, has it not; it has taken active effect amongst the people?—Yes, it has.

13,576. From which they do not show any signs of receding?—No. I think it is unfortunate that the law should be carried out in Leicester.

13,577. (*Mr. Picton.*) Have you always been opposed to compulsion?—Not until I had those particular cases before me, when I saw that the people had conscientious objections.

13,578. Had you any expectation that a rigorous enforcement of the law would put down opposition?—I thought it would be much better to reduce the fine. I fully agreed with the reduction of the fine from 20s. to 10s., and I thought it would have been better to reduce it to 1s. My idea has been that if we could get those people to sign a statutory declaration that they conscientiously objected to vaccination it would be much better than fining them.

13,579. Do you think that that would satisfy the Leicester feeling?—I have not had a conference with the Leicester people upon the subject, but I do not see what objection they could have to signing a declaration that they conscientiously objected to vaccination.

13,580. (*Dr. Collins.*) I think you said that the persons summoned before you under the Vaccination Act belonged to the better artisan class?—Yes.

13,581. Would it be true to say that those were "silly" or "dishonest" people, as far as you could judge?—No, I thought that they were really honest people.

13,582. Or neglectful of their children?—I did not think that.

13,583. Had they come before you as a magistrate under any other charge?—Not any of them.

13,584. (*Sir Edwin Galsworthy.*) As a whole did their objections arise from agitation or from what they considered to be the evil results of vaccination?—I believe they were due to the evil results arising from vaccination; there were none of the agitators present in the town and none of the effects of agitation going on at the time the cases came before me.

13,585. (*Sir Charles Dalrymple.*) What is your test of conscientious conviction?—I examined the people myself personally in each case, and they told me that they had had children vaccinated, and that one of the children had broken out into sores, and all that sort of thing. I am not at all an anti-vaccinator; in fact, my relatives are almost all surgeons; I had two brothers under Sir James Paget.

13,593. When was that?—That would be about 1852 or 1853; that would be the time when he was vaccinated.

13,594. Was he older or younger than yourself?—He was two years my junior.

13,595. I take it that you do not recollect the circumstances of the vaccination?—I do not recollect the circumstances of the vaccination only from what my parents told me afterwards.

13,596. In what way did he suffer?—He was vaccinated at Dr. Fullagar's surgery; he has suffered ever since from soreness of his eyes; his eyes have been affected ever since. Dr. Fullagar's surgery was called an eye infirmary; he was a specialist in eye diseases, and he said to my mother and to my brother that he knew his illness to be the result of the operation; he also stated that the lymph was taken from a diseased child; he had set it aside, but had taken it up inadvertently and had vaccinated my brother from it.

13,597. When did you yourself become an active opponent of vaccination?—I became an opponent of



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compulsory vaccination in the year 1869, but of vaccination itself some years later; after the epidemic of 1872. I believed in vaccination for some years after I opposed compulsion; I opposed compulsion because I thought it was an infringement of personal liberty.

13,598. Was it your experience in the epidemic of 1872 which led to your ceasing to believe in vaccination?—Yes, principally so, but there were various things which led up to it; in the first place there was the observation of my partner, to which I have just alluded, and that was followed eventually by his imprisonment; he was summoned before the magistrates (I think Alderman Stafford was Mayor at the time) in respect of three of his children who were aged 7, 9, and 12 respectively at the time the Act was passed; therefore, the Act had a retrospective action in regard to them; he was fined 20s. in each case and he declined to pay the money. I tried to persuade him, but he said he could not conscientiously do so, and he was imprisoned for 30 days, one of the longest terms of consecutive imprisonment, I believe, which have taken place under the Act.

13,599. You yourself have been prosecuted, have you not?—I have been prosecuted a large number of times; I have some of my summonses here; in all I have received 20 notices and five summonses.

13,600. Were those five summonses in respect of different children?—They were in respect of four children; the first three summonses were in respect of one child each, but the fourth and fifth summonses were in respect to the same child.

13,601. Why were there two summonses issued?—I had one summons under the 31st section, because the Vaccination Officer had fallen into arrears with his work; the summons did not arrive till the child was 15 months old. I had an order made upon me under that summons, and I was summoned again for the non-fulfilment of that order.

13,602. Was there only one penalty?—There were costs in the case of the order and a penalty for the further summons. I also suffered distress warrants for the two last fines and the last order; a duplicate warrant in the last instance was issued against me; they were both issued at the time I was a member of the Board of Guardians.

13,603. We have heard that the Guardians in office, between 1883 and 1886, authorised prosecutions to a considerable extent?—Yes, they did. The first vote authorising them was taken, I think, in October 1883.

13,604. Have you anything upon that point to add to what you have already said?—There is nothing that I wish to add to that.

13,605. Then in 1886 the old members who were in favour of prosecution were almost all defeated, and the result was that the prosecutions ceased?—They ceased altogether.

13,606. What is the next point to which you propose to call the attention of the Commission?—I propose, with your Lordship's permission, to divide my evidence under five heads, but I have first a little more to say with regard to my personal evidence.

13,607. Will you kindly complete your personal evidence?—I wish to give the reasons for my change of opinion; I had always been taught to believe in vaccination; I believe my parents had the whole of the family, a very large one, numbering 11, vaccinated, but the events which occurred from 1869 forward, with regard to the prosecutions which arose under the law, and then my observations during the epidemic of 1872, led me to change my opinion. My wife also, I might add, had suffered from small-pox; she was unvaccinated, but she made a very good recovery, and has no scar left; she suffered during the epidemic of 1852. I should like also to say that, having taken up the views which were becoming more prevalent in opposition to vaccination, we suffered a good deal of loss in business in consequence of my partner's imprisonment. At that time a good deal of odium was cast upon the anti-vaccinators, and it was rather a serious matter to oppose the law. Subsequently, in 1872, I observed the progress of the epidemic, and I saw a very large number of small-pox cases, and I noticed, too, the returns which were published from week to week by the Medical Officer of Health stated that a much larger number of cases arose from those who had been vaccinated than from those who had not been vaccinated; and I remember from some public meetings that were held at the time

that a statement was made that at least 10 out of every 11 who suffered from small-pox had been vaccinated. I tried to look up the returns, but found it impossible to get any accurate return as to the vaccinated and unvaccinated apart from those weekly statements which were published by the Medical Officer of Health. He was instructed by the Local Board to write to the medical practitioners of the town asking them to furnish him with returns, but he never got a complete return of the whole town because a number of medical men were reluctant to send in returns. A great number of the inhabitants were rather averse to having it known that they had small-pox in their houses at the time, so that the returns were always incomplete; but the impression which operated upon my mind was that a larger number suffered who were vaccinated than who were unvaccinated, more even, proportionately, because, of course, there were a larger number in the town then who had been vaccinated. I saw a large number of cases, and the experience of that epidemic, together with other matters which occurred at the time, and certain articles which I had an opportunity of reading, decided me entirely against vaccination.

13,608. Have you ever gone carefully into the statistics showing the relation of the cases amongst the unvaccinated and the vaccinated as compared with the population vaccinated and unvaccinated, or is it merely a general impression?—At the time it was a general impression, but since that date I have read pretty considerably on the subject, though of late years I have ceased to take so much interest in it; but nothing I have since read removed the impression made upon my mind at the time.

13,609. Does that conclude all you have to say about personal matters?—I should like to say that when I was a member of the Board I appealed to the Board, knowing, as they did, that I had been prosecuted several times, and that my goods had already been once sold by auction, as to whether they would not in my case withdraw the prosecution, which was evidently degenerating into persecution. I furnished the Vaccination Officer with an affidavit, and wished him to lay it before the Board, and to ask them if they would withdraw the prosecution. He laid it before them, and I should like to be permitted to read what I had to say to them. I stated: "I am the father of a child of the name of Hilda Gwendoline, of the age of one year and upwards. That I am well aware of the provisions of the Act of 1867, and am not desirous of unreasonably neglecting its provisions. I am afraid to submit my child to any surgical operation that is likely to cause, or to be capable of causing, blood poisoning or even death. I am informed and verily believe that the result of vaccination has often caused intense suffering and disease to the patient, and, in many instances, death has ensued. In one particular instance to my own knowledge the child of Henry Bayley died from the operation, and I know that my own brother has suffered all his life from the effects of vaccination. Fear, therefore, not parental or legal neglect, but parental love prevents me from taking any step that will facilitate the poisoning of my child by the surgical operation called vaccination. For the above reasons, which, to me, are serious and sincere, I submit that I am not guilty of any neglect or offence within the meaning of the above-named Act." I tendered that to the Guardians and it was returned to me, and when I was summoned before the magistrates I tendered it to the Bench. At that time there were two courts sitting, and my case was postponed, so that the whole Bench of magistrates could meet in the principal court. The magistrates gave me a very careful hearing, but at the close they stated that they must enforce the law, and a fine was inflicted upon me. I did not pay the fine; my goods were sold for it, and that is really the last summons which I have had. Since that time the prosecutions have been practically stayed by the action of the Guardians, in fact, absolutely so. Then I should like to refer to the action I took with regard to the Barrow Board of Guardians. I was elected a member of that body three years ago, and I moved a number of resolutions which were always defeated, but upon the appointment of this Commission the chairman of the Board induced the Board to suspend prosecutions until your report should be issued. And, then, with regard to the Town Council, I have been a member of that for some years, and though for many years past, especially since 1871, the members returned to the Council have been pledged to oppose compulsory vaccination, the question was never submitted to the



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vote in that body till I submitted it a year ago last month. I then submitted the resolution, which was presented to you by the deputy Mayor, and the following month I moved the resolution, which was carried, that the deputy Mayor and the other magistrates should present that resolution.

13,610. Presuming that you have now concluded your personal evidence, under what heads do you propose to classify the rest of the evidence you have to offer to the Commission?—Having concluded under the first head, I propose to classify the rest of my evidence in the following order: secondly, to deal with the administration of the law and the prosecutions by the Guardians. The points under that head will arise out of the book which has been already presented to the Commission. Under the third head I would take the magisterial proceedings which have resulted from the prosecutions by the Board of Guardians, and under the fourth head I will deal with some injuries and deaths which have followed vaccination, particulars of which have been sent up to me; and, finally, I propose dealing with the vital statistics of Leicester.

13,611. Under the second head what have you to present to the Commission?—I should like, in the first place, to refer the Commission to the action taken by the Leicester Board of Guardians immediately after the Act of 1867 was passed. In July 1868 the Guardians appointed a Vaccination Officer, and in that year the prosecutions began; he was appointed upon the 28th of July, and as the result of his appointment the number of vaccinations rose considerably. The Vaccination Officer immediately upon his appointment entered into his work with very great zeal, and on November the 3rd of the same year he asked for instructions against defaulters. The Guardians gave him authority to proceed, and several summonses resulted in that year. But I should like also to refer to a resolution which was moved on the Board even at that early day. On the 8th of March 1870, which is almost two years subsequently to the appointment of the Vaccination Officer, it was moved by Mr. P. Taylor, who was a member of the Board (you will bear in mind that there is a distinction between this Mr. P. Taylor and the Mr. P. A. Taylor who formerly represented the borough), and seconded by Mr. Willmore: "That this Board believes that the inherent right of parents to protect their offspring against diseases is infringed by the vaccination laws which also provide for an application of the rates raised for the relief of the poor, which tends to increase the burdens of the ratepayers by promoting disease and pauperism, and, therefore, resolves to petition Parliament for the repeal of the Vaccination Acts." That resolution was defeated unanimously, and it states in the official return that there were 18 against the motion and none for it; even the mover and seconder of the resolution failed to vote for it. I cite this only as an instance of the feeling which was then springing up. Mr. Taylor, who moved the resolution, and Mr. Willmore, were, I believe, the only two members of the Board at that time who were opposed to vaccination.

13,612. That proposed resolution was rather strong, was it not, from the point of opposing compulsory vaccination, in suggesting that vaccination not only promoted disease but pauperism. Possibly it may have been suggested to the mover and seconder that it might have been more mildly worded, and that that may have led to the vote showing the result that it did?—I cannot say what suggestions were made to them, but I conceive that the feeling which led to the moving of a resolution of that kind would be that the provision of funds for vaccination out of the public rates would tend to increase pauperism.

13,613. (*Sir Edwin Galsworthy.*) You say they did not vote for their own resolution; you do not mean, I presume, that they were convinced to the contrary in the course of the debate?—That was not so; I simply find that no votes were registered in favour of the resolution. I know Mr. P. Taylor was strongly favourable to the resolution, but I cannot account for the fact that he did not vote for it. There is another resolution that I would like to refer to with regard to the case of Mr. Millington. In Leicester in the administration of the law there have never been any cases of cumulative penalties except in the case of Mr. Millington. He had been already fined 20s., and it was decided that further proceedings should be taken with respect to the same child; thereupon Mr. Millington was summoned before the magistrates and a fine imposed upon him, but that fine has never been paid. Practically, the vaccination law was carried out pretty fully, but on the 1st of September 1880 the

first complaint was received from the Local Government Board with regard to the numbers that were left unvaccinated. The letter sent from the Local Government Board reads as follows: "I am directed by the Local Government Board to inform you that on examining the return for the period July to December 1879 recently received from the Vaccination Officer of the Leicester Union, the Board find, that of the 2,350 children whose births were registered during that period, 284 are unaccounted for as regards vaccination. I am to request that the Guardians will obtain from the Vaccination Officer, and forward to this Board, an explanation of his omission to account for these cases." That is practically the first complaint of the Local Government Board since the Act of 1867 in regard to the neglect of vaccination. This letter was considered by the Board, and Mr. Maskell, the Vaccination Officer, attended in reference to the letter of explanation he had sent to the clerk. The clerk was directed to write to the Local Government Board to state that the arrears were owing to the strong opposition to the law, and that the Guardians would take into consideration the desirability of providing the Vaccination Officer with assistance. During this time the opposition was growing, and subsequently the Board decided to appoint an assistant officer on account of the arrears into which the notices had fallen. The Local Government Board wrote a letter approving of the proposal of the Board of Guardians to appoint an assistant officer, and what I wish to do is to show that at this time, although the opposition to the law was growing very rapidly, the Guardians were themselves unquestionably desirous of carrying out the law. There was very great opposition to the appointment of this assistant officer. A deputation was sent from a public meeting in the town, but the Guardians did appoint that officer for a certain period, and it was hoped at that time that he would pull up the arrears. The memorial which was sent to the Board of Guardians against this application was presented on the 14th of December, but at the same meeting the Guardians proceeded to appoint an assistant officer at a salary of 18s. a week. Then in the year 1883, to which period I have already alluded, the first decided step was taken, the first vote in fact of the Board was taken, against carrying out prosecutions. On the 9th January 1883 the Vaccination Officer having brought before the notice of the Board 17 cases which had not paid the fine imposed by the magistrates, it was moved by Mr. Kemp, and seconded by Mr. J. B. Taylor, that the Vaccination Officer be instructed to apply for distress warrants. Mr. Lennard moved as an amendment, which was seconded by Mr. Sharp, that the Vaccination Officer be instructed not to apply for distress warrants, and that amendment was carried by 14 against 8. I was one of the 17 defaulters, and from that date, the 9th of January 1883, the prosecutions remained in abeyance till the election of the new Board in April 1883. I should like to explain to the Commission that that election of 1883 was fought mainly upon the question of compulsory vaccination, and a considerable majority were returned to the Board who were pledged to vote against compulsion. No steps were taken to raise the question of carrying out prosecutions until after the defeat of Mr. P. A. Taylor's motion in the House of Commons, when one member of the Board of Guardians, Mr. Panter, gave notice of a resolution to renew prosecutions. I moved an amendment to that resolution, and that amendment was carried, against renewing prosecutions, by 18 votes to 14. Later on in that year, however (on the 2nd October 1883), prosecutions were renewed by the casting vote of the chairman, there being 16 for and 16 against. I ought to explain that that result arose from several members who were pledged against compulsion voting contrary to their pledges, and as the result of that there was great agitation in the town against those members of the Board, calling upon them to resign their seats. They did not, however, resign their seats till April 1886, when most of them who were put up for re-election were defeated. During this time a number of resolutions were passed at public meetings which were forwarded to the Board against prosecutions, and eventually it was decided that a return of vaccinations should be printed and circulated amongst the members of the Board. The copies that we have handed in to-day are copies of the first return that was printed. During the existence of that Board, which was elected in 1883, the law, as I have already observed, remained in abeyance for about 18 months; but during the other 18 months a larger number of prosecutions were carried out than in any other period, amounting, I believe, to close upon 2,600. The resolution which was passed in October, and con-



firmed in November, authorising prosecutions affected about 1,000 prosecutions, which were nearly all carried out, all but 18. Those 18 cases were brought again before the Board and they were exempted for various reasons (a number of the parties were widows left with large families), and from, I believe, a genuine feeling of sympathy with the defaulters it was decided by the Board to withdraw the prosecutions in those 18 cases. Later on the prosecutions were renewed, but were finally abolished by the vote of 1886. Subsequently to that time I ought to explain that, notwithstanding the decision of the Board not to prosecute, the notices to parents have still been issued threatening proceedings before the magistrates, and they are issued right up to the present day. Under Notice B. a threat is made to bring the parent before the magistrate, and it was felt by the Board that as they had decided not to carry out prosecutions, it seemed an anomaly to issue notices threatening proceedings which were never carried out. In consequence of that a resolution was moved to cease issuing Notice B., and it was carried by 14 votes against 1. After the vote a letter was addressed to the Local Government Board by the clerk, informing them of the decision, to which a reply was returned stating that they could not allow the Board to cease issuing that notice.

13,614. (*Sir Edwin Galsworthy.*) What date was that?—The resolution to cease issuing Notice B. was carried on July the 1st, 1888, and the letter of the Local Government Board in reply is dated October 20th, 1888. The paragraph in the letter referring to it is this: "I am to point out to the Guardians that by the Order referred to, where the Vaccination Officer finds on his personal inquiries that the parent is in default, he is required to specify an exact date by which the parent must have complied with the law and to give a notice in the prescribed Form B., or to the like effect, and I am to state that the Guardians are not authorised to absolve the Vaccination Officer from the obligation thus imposed on him." The Guardians acquiesced in that decision and they have to the present time continued to issue this notice.

13,615. It is not they who issue it; it is the Vaccination Officer who issues it?—He issues it under their instructions.

13,616. (*Chairman.*) The wording of that letter seems distinctly to put it as a personal duty with which the Guardians have nothing to do?—Although it is put in that way the Vaccination Officer has always acted loyally to the instructions of the Board of Guardians rather than to those of the Local Government Board, although he has at times communicated with the Local Government Board direct. Finally, the new Board that was elected in 1889 passed a resolution endorsing the policy of the previous Board as against prosecutions. An amendment to that was moved by Mr. Billings and seconded by Mr. Pulsford, "That this Board does not pledge itself to any line of action upon the vaccination question until the Report of the Royal Commission has been given in to Parliament." Upon a vote being taken there were 4 for the amendment and 31 for the resolution. No further vote of the Board has been taken in reference to prosecutions since that date, but some questions have arisen between the Guardians and the Local Government Board in respect to the cottage homes. Some years ago the Guardians decided to place the Union children at cottage homes outside the borough, and a short time ago a letter was addressed by the Medical Officer, Dr. Steele, to the Local Government Board to this effect:

"Great Peatling, Lutterworth,  
14th October 1889.

"Dear Sir,  
"The Guardians of the Leicester Union having issued an order requesting me as Medical Officer of the cottage homes for the above Union not to vaccinate any more children, I should be glad of your opinion on the subject. I have communicated with Dr. Franklin Parsons and he advised me to write to you. I might add that with a few exceptions all the children in the homes are vaccinated.

"Faithfully yours,  
"RICHARD STEELE."

The Local Government Board enclosed that letter of Dr. Steele's to the Guardians with a letter of their own requesting to know the opinion of the Guardians or the reasons which had decided the Guardians to take that

step; to which the Guardians reply upon the 7th of December as follows:

"My Lords and gentlemen,

"I am directed by the Guardians of this Union to acknowledge the receipt of your Honourable Board's letter of the 7th day of November in reference to the vaccination of children at the cottage homes. In reply thereto, I am directed to state that the Guardians have directed the Medical Officer of the homes not to vaccinate any more children. This they have done in consequence of the strong opposition to vaccination in Leicester from whence the children come, and they object to enforce a law, either in the Workhouse or the homes, which they have decided not to enforce in the Union at large. I am directed to add that there are only six children in the homes unvaccinated, and in the case of two of the children it was the dying wish of their mother that they should not be vaccinated.

"I have the honour to be,

"My Lords and gentlemen.

"Your obedient servant,

"LIONEL P. CHAMBERLAIN, Clerk."

This letter was replied to by the Local Government Board, but finally it was resolved to rescind the resolution that was passed on the 11th of April, and the following resolution was substituted for it: "That the Medical Officer of the cottage homes shall in future report to the Guardians the names of any children who, in his opinion, require vaccinating, but shall await instructions from the Guardians in each individual case before carrying out the operation, so that the wishes of the parents of the children may be ascertained."

13,617. Does that conclude what you have to say on the first head?—I have two other subdivisions of that head. I should like next to refer to the efforts which the Guardians made (although they were continuously persistent in their action in respect to carrying out of prosecutions under the law) to induce the magistrates to reduce the fines. In 1875 they passed a resolution asking the magistrates to reduce the fines. The magistrates replied that they could not do so. I know as a matter of fact the magistrates had met and had decided to impose a uniform penalty and it was felt by the magistrates who preside at the different courts that they could not possibly deviate from that arrangement without a meeting of the whole body of magistrates. A meeting of the whole body of magistrates was called, but at that time they could not see their way to make any reduction.

13,618. Was that after the reduction to 10s. was made?—It was prior to the reduction to 10s. Subsequently to that, two years later, in 1877, a further resolution was passed also asking the magistrates to reduce the fines; and on that occasion they could not see their way to reduce them. In 1879 another resolution was passed asking for a reduction, and that was disregarded. In 1881 a resolution was passed asking them to reduce the fine to 6s., and that was also disregarded, and a letter from the magistrates was received in reply assigning their reasons: "Your letter containing a copy of the resolution passed by the Board of Guardians requesting the magistrates to reduce the penalty of 10s." (it had in the meantime been reduced to 10s., but not by any action of the Board), "including costs, as usually imposed on persons for disobeying orders requiring them to have their children vaccinated (and made under section 31 of the said Acts) to the sum of 6s., including costs, have been duly considered at a special meeting of the Justices, and I am directed to inform you that the magistrates, whilst desiring to pay every attention to the memorial of the Guardians, cannot further reduce the usual fine of 10s., including costs, imposed in the above cases. I have, however, respectfully to point out to the Guardians that it is open to them to instruct their Vaccination Officer not to ask for costs against defendants when applying for orders under the 31st section. This course would make the fine and costs payable by the defendants under both sections alike, and is one to which the Justices, whilst declining to lay down a strict rule in the case, see no objection. I am, dear sir, yours very truly, R. R. Blackwell, Clerk to the Justices." In 1883, after the Board had decided to renew prosecutions, a further resolution was passed asking the magistrates to reduce the fines to 5s., and I should like to observe that that resolution emanated from the Guardians who had already voted for the renewal of prosecutions. A letter was returned, in reply to that resolution, from the magistrates declining to reduce the

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finer. In 1885, in consequence of the very large number of prosecutions which were taking place at that time, and also in consequence of the deficiency of work which existed in the town, which was liable to bring some hardship upon the working classes, a deputation was appointed from the working classes to the magistrates. Alderman Hart was Mayor at the time, and I was one of the deputation and introduced them; but before the deputation waited upon the magistrates a special meeting had been summoned of the whole body at which they had decided not to reduce the fine, and the fines were continued at 10s. right up to the end of the carrying out of the prosecutions. I have one other matter with regard to this that I should like to refer to, and that is to the memorials which have been addressed by the Guardians to the Local Government Board. Although the Guardians have been desirous all through, until recent years at any rate, of complying with every wish of the Local Government Board with regard to carrying out the law, they have at times addressed some very strong and rather remarkable memorials to the Local Government Board. The one that I desire to call particular attention to was passed on the 2nd of August 1879, and it reads as follows:

"The Guardians of the Leicester Union, having carefully considered the letter sent to them from your Honourable Board on July 15th, beg to lay the following facts and arguments before you in reply to the statements therein. You declare that you cannot regard as well founded the allegation that there is an unsettled state of medical opinion in regard to the safety of using humanised vaccine lymph. In answer to this we beg to mention the following medical gentlemen as a few among the many who disagree with the present system.

"Dr. Enoch Robinson, Medical Officer of Health for Dukinfield, near Manchester, says, in his report for 1875: 'Before the child is three months old it meets with another influence that is calculated to strengthen any infective process that may be at work in the system, and originates such a process in a child otherwise healthy and vigorous. The most powerful and infective substances are the various forms of purulent matter (a low condition of living animal matter, and essentially a phase of disease). One of these purulent forms of matter is the fluid of the vaccine vesicle. When inserted and absorbed into the living blood by an unnatural method, it exerts an influence of an infective character opposed to the healthy vital power, and weakening to the extent of its influence the natural vigour of the body.'

"Dr. Small, a physician and Justice of the Peace, said at a meeting held on November 17th, 1875, at Boston, in Lincolnshire, that 'he had been compelled to change his opinion on vaccination which could not prevent small-pox, but which he himself knew, as was acknowledged by the ablest men in Europe and America, was productive of fearful disasters and death.'

"Dr. Cameron, of Glasgow, has also introduced into Parliament a Bill, backed by Drs. Lyon Playfair and Lush, having for its object the provision by the State of a supply of 'calf-lymph' for vaccination, which is in direct opposition to the present system of using humanised lymph.

"Dr. Wyld, of London, also strongly opposes the use of humanised lymph, and in a letter to the London daily paper says: 'My letter on vaccination direct from the calf has drawn upon me more than 300 letters and visits from medical men, all begging for information, or for calf-lymph, and urging me to persevere in so good a cause.' He further says in same letter: 'There exists only two objections to calf vaccination, viz., the difficulties which attend its production, and its interference with an established order of things. Surely these difficulties must give way before the serious objection to our present system entertained by a large and increasing section of the public.'

"Dr. Green, L.R.C.P.E., M.R.C.V.S., of Birmingham, writing in the Birmingham Medical Review for 1876, strongly advocates the use of calf-lymph, and eulogises the system carried on on the Continent and says, speaking of the system here: 'I cannot understand how our Government continue to send out vaccine lymph in tubes,' adding 'that common report credits this system with too frequent failure.'

"Sir Thomas Watson, Bart., says in his article in the 'Nineteenth Century' in reference to the subject of calf vaccination as opposed to the system of vaccinating with humanised lymph: 'That those better

"methods practised in Russia and in Belgium, which I have been endeavouring to describe, may be clearly recognised and frankly admitted in this kingdom is my most earnest hope and desire.'

"These quotations, though only a few out of the many we could mention, will, we trust, satisfy your Honourable Board that our allegation of the unsettled state of medical opinion is well founded.

"Your letter further states that 'there need be no apprehension that vaccination will injure health or communicate any disease.' Your official informants do not appear to be aware of the very important statements recently made by Mr. Jonathan Hutchinson in his work on Vaccination Syphilis. Mr. Hutchinson is recognised by Dr. Seaton to be a high medical authority, and we beg to remind you that he was selected to report upon the 12 cases of vaccination syphilis in 1871. He says, 'There can be no doubt that the danger of transmitting syphilis (in vaccination) is a real and very important one.' 'Concealment in such a matter appears to me to be the very worst policy,' and 'that a syphilitic infant should appear to be in perfect health as far as outward appearances are concerned is by no means unusual.'

"Doubtless your Board is aware of the important issues here raised, for if syphilis be transmissible in vaccination, and if the disease cannot be always detected in the vacciner, then pure lymph cannot be guaranteed, and we beg to point out that the late Medical Officer of the Privy Council expressed his opinion that if 'the Government could not reasonably guarantee that it gave pure vaccine lymph, it should not force the public to accept it.' We are, therefore, not surprised at Mr. Hutchinson's remark that 'since the publication of his cases he has not infrequently received from medical men letters of remonstrance and complaint.'

"Sir Thomas Watson, Bart., says on this point in his article in the 'Nineteenth Century' for June 1878:

"It is too certain, however, that one objection really formidable does exist, that the operation may, in some few instances, impart to the subject of it the poison of a hateful and destructive disease peculiar to the human species and the fruit and Nemesis of its vices.' He further says in the same article, 'I can readily sympathise with, and even applaud, a father who, with the presumed dread and misgiving in his mind, is willing to submit to multiplied judicial penalties rather than expose his child to the risk of an infection so ghastly.'

"In 1871 we were assured there was no danger if blood were not conveyed with the lymph, but Mr. Hutchinson says: 'It is highly probable that it is not absolutely necessary that blood should be used in vaccination in order to convey syphilis,' and he adds, 'If it is necessary to convey some of the elements of the blood in order to convey syphilis, it is probably not necessary that they should be visibly red.' He says also: 'The best means to prevent the recurrence of these lamentable accidents is the diffusion of the knowledge amongst the profession that such accidents are possible. Until my original papers were published almost the whole of the British profession was incredulous on this point, and in spite of the publicity which was then given to the facts there still remain, I believe, some who are either uninformed or unconvinced.'

"We presume that your Board is guided by the medical evidence in the Vaccination Committee, in which it was stated that vaccine lymph will convey nothing but the vaccination disease, and that a child may be suffering from syphilis, and the lymph from its arm may be used without any other result than the satisfactory vaccination result, and that it is of no consequence of what disease the child suffered. (Questions 4070, 4072, 4073.)

"Your Honourable Board states in your letter that since the date of the report of the Vaccination Committee, their inquiries have not made them acquainted with any instance of disease communicated by the vaccine lymph employed. This is quite possible, for in reference to the twelve cases of syphilis after vaccination, proved before the Vaccination Committee, Dr. Seaton said he 'did not believe that it was the inoculation from the lymph which produced the syphilitic infection.' Of course, until your Board is prepared to admit the possibility of such infections, you cannot be expected to admit their occurrence. But Mr. Hutchinson admits their occurrence and has published in his 'Illustrations of Clinical Surgery' a number of cases of vaccination syphilis subsequent



to the above date, and so great is the danger that Mr. Hutchinson recommended the vaccinator to avoid vaccinating from all first-born children in order that some guarantee of freedom from taint may be given by the development of one healthy child.

Your Board further reminds us of the statement that vaccination will neither injure health nor communicate any disease when 'proper precautions' are taken against injury to health or communication of disease by the operator. We shall not attempt to disguise the fact, that a belief is prevalent that much injury has been done, and much disease superinduced in Leicester, but as we are expected to enforce the risk upon our constituents, we wish to do something more than relate the above truism. We therefore respectfully ask, what are the 'proper precautions' alluded to, and whether they are such as we may superintend and introduce for the security and satisfaction of the people we represent, among whom the friends of vaccination complain of the mischief done by impure lymph, as strongly as the anti-vaccinator. We ask, what are the known tests of the purity of the vaccine lymph in use, and of the presence or absence of syphilitic germs within it, and whether such germs have been on any occasion discovered and recognised by microscopic examination, and we ask if we have any power to see that such tests are applied? For if there be no such tests, and we have no such power, then our enforcement of vaccination without insisting upon 'proper prosecutions,' or even knowing what they are, considering the possible danger arising therefrom, is the exercise of a power we do not care to share.

"It is useless to tell our constituents that vaccine lymph from a syphilitic source will not convey syphilis; we should satisfy neither vaccinators nor anti-vaccinators and merely discredit it ourselves. Although the use of such lymph may not be illegal, it is none the less immoral; and if we are compelled to extremities there ought to be some independent court of appeal, commanding public respect, to which injured parties might apply with some hope of sympathy and redress.

"Your letter further states that 'close and habitual inquiries by the Board have not made you acquainted with a single instance of disease communicated by the vaccine lymph.' The prosecution of over 200 of our townsmen during the last twelve months in deference to your authority, and the incarceration of 30 of them in our gaol since the enactment of the compulsory clauses, has made us painfully aware, through the stimulation these prosecutions have given to inquiry, that a great deal of injury is alleged to have arisen in Leicester from vaccination, and we should be glad to know when, where, and by whom your close inquiries were made in this

town, so that we may satisfy ourselves, by comparison of the evidence, of the value of the allegations.

"With reference to the statement in your letter, that the present system of fining is not one of compounding for the offence, we beg to remind you that such is the fact, and it has been urged many times in the debates on this question in the House of Commons, and that as the general plan throughout the country is that of simply fining once or twice for non-compliance, it does become, especially with those who can easily afford to pay the fines, a matter of compounding for the offence of refusing to have their children vaccinated.

"With regard to the judgment and discretion with which the compulsory powers are administered, we beg to lay before you the following instances of the enormous differences in the infliction of penalties. In the towns of Bedford and Boston the now usual course is to fine each one 6d. and to prosecute only once, in our town of Leicester a fine of 10s., including costs, is inflicted, and that only once; while in many places the full penalty of 20s. and costs are inflicted and that many times over, as, for instance, Henry Pride and Benjamin V. Scott were summoned in Liverpool, at the county police office, on July 21st last and each fined 20s. and costs for non-compliance with the compulsory vaccination clauses. Pride has been previously mulcted in penalties 18 times and Scott 17 times. We could mention many such cases, and give instances by the hundred in which the full penalty is inflicted, but should your Board desire further information on this point you will find it in the 'Anti-Compulsory Vaccination Reporter', in which a condensed account of all the prosecutions under the Vaccination Acts is given every month.

"Taking into consideration all the facts and statements we have laid before you, we again respectfully urge that you will endeavour to relieve us of the responsibility of prosecuting our townsmen for the exercise of their conscientious convictions in refusing to have their children vaccinated, by introducing into Parliament or supporting any Bill for abolishing the compulsory clauses of the Vaccination Acts.

"Elected to be the Guardians of the Poor, we feel that we are acting the part of oppressors in carrying out the law as it now stands. Many of our constituents, we know, deem vaccination a blessing, but many deem it a curse. We do not wish to be made use of to force the opinions of either upon the other. We prefer to throw our weight into the scale of even justice for both views, believing, as we do, that open discussion is a more elevating and civilising influence than tyranny and repression of private judgment.

"The medical opinions here quoted are principally those of vaccinators, but opposed to the present system."

Mr.  
J. T. Biggs  
11 Feb. 1891.

Adjourned till Wednesday next at 1 o'clock.

## Fifty-sixth Day.

Wednesday, 18th February 1891.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

SIR JAMES PAGET, Bart.  
SIR CHARLES DALRYMPLE, Bart., M.P.  
SIR EDWIN HENRY GALSWORTHY.  
SIR WILLIAM SAVORY, Bart.  
DR. WILLIAM JOB COLLINS.  
PROFESSOR MICHAEL FOSTER.

MR. JONATHAN HUTCHINSON.  
MR. J. ALLANSON PICTON, M.P.  
MR. SAMUEL WHITEHEAD, M.P.  
MR. F. MEADOWS WHITE, Q.C.

MR. BRET INCE, *Secretary*.

MR. JOHN THOMAS BIGGS further examined.

13,619. (*Chairman.*) Just before the Commissioners adjourned at their last meeting you called attention to a memorial which had been sent to the Local Government Board by the Leicester Board of Guardians. Is there anything which you wish to add to your previous

evidence before passing to another branch of the case? —I should like to refer to one or two matters which occurred at the last meeting, referring to one question more particularly.

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13,620. Do you mean by way of correction?—Not exactly, but by way of supplementing the answer I then gave. At Question 13,368 the question arose as to the variations in the number of private vaccinations as compared with public. I have made further inquiry, and the answer I gave is the only answer which can be given to that question. On looking the figures through it does not appear to fully account for the variations. I have also made inquiries of the Vaccination Officer, and he is unable to account for them in any other way. Since I was here the Guardians have had some fresh tables printed which bring out the vaccinations for the half-year 1890.

13,621. In continuation of and on the same basis as the previous table?—It is precisely on the same basis; but there was an error in the previous table in respect of the year 1877, which your Lordship will notice was corrected with pen and ink, an error in the column as to "cost." This fresh table offers no further explanation as to the variations in the private vaccinations; but if we deduct the public vaccinations from the total vaccinations, we find that even in the earlier years there was a considerable variation, and it becomes, perhaps, only more marked in the later years, owing to the fact that the total number of vaccinations was so very small. The answer I gave was that the medical practitioners kept back the certificates and sent them in in batches. I find that this practice has actually been carried out, but it would not affect the numbers very largely; and the only supplementary answer I can give upon that point in regard to the later years is that the administration of the law was entirely disorganised; and as the Board of Guardians passed resolutions, first authorising proceedings, and then practically suspending them for a short time, would account for the great rise of private vaccinations which appears in some years compared with other years.

13,622. What is the next matter you wish to state in addition to any answer you gave upon the last occasion upon the matters then inquired into?—I should like also to say that, since I was here last week, I have received from the Vaccination Officer a further Notice B threatening me with proceedings in respect of one of my children. I refer to that so that I may show to the Commission that, so far as notices are concerned, the law is still in operation in Leicester. The notice is dated 13th February 1891, and it states that if I do not transmit within seven days a certificate certifying the vaccination of my child it will be the duty of the Vaccination Officer to report my case in order that proceedings may be taken as the law directs.

13,623. Is that in respect of a child recently born?—It is in respect of a child about three years old. Then there is one other matter I should like to refer to. Dr. Denton, one of the Public Vaccinators, has received an intimation from the Post Office authorities that he will be required to vaccinate some applicants for posts as telegraph boys. It appears that he has written to Lamb's Conduit Street for a supply of lymph; he had no lymph; and they have declined to supply him with any free, excepting for primary vaccinations. These boys apply for re-vaccination, under the regulations of the Post Office, and he states in a letter to the clerk to the Guardians that he will be charged 1s. for each tube of lymph, and he only gets 1s. for a re-vaccination, so that he would have to carry out the operations free. I notice that in the regulations he is not required to do that unless he has lymph to spare, apart from primary vaccinations, which of course he has not; and under the circumstances he writes to the clerk to the Board of Guardians to ask for advice as to how he shall proceed in the matter. I do not know what advice has been given, but I thought it was worth mentioning.

13,624. Is that all you desire to add before proceeding to the evidence subsequent to the date of the memorial?—Yes, that is all.

13,625. Then what was your next point when we left off on the last occasion?—I was calling the attention of the Commission to the memorials which have been presented to the Local Government Board, from the Guardians, and the point I wished to put forward more particularly was this, that while sometimes the charge has been made against the Leicester Board of Guardians, and in fact against the authorities in general in Leicester, that they have been unmindful of the practical issues of the question, I wished to show the Commission that in the memorials which have been addressed to the Local Government Board the Guardians really entered into the merits of the question and considered it from every possible point of view. Since we

were here last week, the memorial has been printed and is before you in my evidence; I have a number of notes here referring to the expressions of opinion on the part of the medical men which were cited in that memorial.

13,626. Was that memorial replied to?—That memorial was replied to.

13,627. What was the date of the reply?—The date of the reply was the 15th of December 1879. On August 14th that memorial was despatched to the Local Government Board, and they acknowledged it in their reply, stating "that the serious illness of their Medical Officer has been the cause of the delay in replying to the Guardians' observations on the subject of vaccination; but they are unwilling that those observations should remain without such an answer as befits the importance of the subject and the attention the Guardians have bestowed on it."

"The Board, however, do not propose to enter into a detailed consideration of the quotations from medical writers which the Guardians adduce as evidence of a change in the general medical opinion on the subject of vaccination; since those quotations do not in the Board's judgment, indicate any change in the opinion, based on the experience of three-quarters of a century and progressively confirmed, as regards England and Wales, by the observation of some 700,000 vaccinations a year, viz., that, admitting certain minute elements of risk in vaccination as at present conducted, this risk is inappreciable in comparison with the enormous assured advantage of protection against small-pox."

"It appears, indeed, to the Board that the Guardians, while considering the question whether, and in what way, injury may possibly result from vaccination, are in danger of disregarding the teachings of experience as to the real amount of that risk. Many millions of vaccinations have been performed safely, while only in a very small number of cases is any injury alleged and among these, on examination, only a few cases of injury in any way traceable to vaccination are found. It is in view of this experience, rather than from conclusions on the pathological questions discussed in the Guardians' letter, that the Board, having regard to the risk to which unvaccinated persons are exposed of dying of small-pox, are convinced of the high importance of vaccination and of the propriety of its being enforced."

"The Guardians, indeed, do not appear to dispute the advantages of vaccination as a protection against small-pox, and their contention that the danger of injury from vaccination by humanized lymph counterbalances this advantage, and that vaccination should, therefore, not be enforced, seems rather to point to the introduction of vaccination direct from the calf than to the abolition of compulsion. To the Board, however, considering that experience has abundantly proved that vaccination, as now conducted throughout the kingdom from one child to another, is proper to be enforced, the question whether calf vaccination should to any extent be substituted for the present system, appears an altogether separate question from that of compulsion. This question has long been, and still is, under the Board's most careful consideration. At present any person who desires his child to be vaccinated with calf lymph may, at a small cost, have the operation so performed by a private medical practitioner; such lymph being an article of sale, and readily obtained in London. In determining, however, whether such lymph should, even in part, be substituted for humanized lymph in public vaccination, and in the public lymph supply of the kingdom, the Board have not only, nor indeed principally, to consider whether such a substitution would still further diminish the minute risk which now attends vaccination; but it is needful for them to have paramount regard to the question, whether the change could be effected without introducing into public vaccination practical difficulties which would diminish the total amount of protection now offered to the community against small-pox."

"The maintenance of this protection is, in the opinion of the Board, and, they believe, in the opinion of the Guardians, of the greatest importance; and no change of system that endangers it can be admitted. If hereafter, as the results of their sustained inquiries into both the scientific and practical aspects of the operation, the Board should become satisfied that there would be advantage to vaccination, without impairing the general vaccine service of the kingdom, in some use of animal instead of humanized lymph, the



" Board would not be slow to make a change in the existing arrangements for public vaccination; just as heretofore a succession of changes in former arrangements was made by the central authority with the result of attaining the present high degree of efficiency and safety.

" As regards the 'great deal of injury' which the Guardians state is 'alleged to have arisen in Leicester from vaccination,' no inquiry was made by the Board, because no information was given to them of any cases of such injury at Leicester. As the Guardians only state that such injury 'is alleged' to have arisen the Board presume that the allegations were not confirmed by any skilled inquiry. The Board cannot but regret if the allegations were allowed to pass without examination; and they request that if any cases of alleged injury from vaccination are, in the future, brought to the knowledge of the Guardians, they will, without more delay than is necessary to satisfy them that the complaints are made in good faith, inform the Board of the circumstances in order that inquiry may be directed.

" The present state of the case may, in the Board's opinion, be thus summed up: The risk of injury from vaccination is extremely minute. The danger of death from small-pox to which unvaccinated persons are exposed is very great. Every prudent person would therefore, without compulsion, have his children vaccinated, and the Legislature after full investigation has provided that this salutary precaution shall be enforced. It remains to be proved whether the risk of injury from vaccination can be still further diminished by using non-humanized lymph, and whether such a method of vaccination can, in practice, find its place in a system of public vaccination that deals with more than half a million children in each year. Whatever conclusion is arrived at on these questions, no reason is shown why vaccination as at present conducted should not be enforced.

" The Board have thus far replied to the Guardians' letter without reference to the duties which the law imposes on the Guardians and on the Board, and as if the expediency of the law were solely in question. The Board would, however, fail in their duty if they omitted, before closing this letter, to point out that under the Vaccination Acts the enforcement of vaccination is obligatory; and they trust that this obligation will not be disregarded by the Guardians of the Leicester Union."

13,628. What is the next matter to which you wish to refer?—The next matter that I wished to refer to was a further memorial, which was addressed by the Board of Guardians. The question was again brought before the Board in 1884; at that time the proceedings against defaulters under the Vaccination Act were very largely increasing, and a resolution was carried by the Board (although I should like the Commission to remember that the Board was in favour of prosecutions) that a memorial should be presented to Sir Charles Dilke, as President of the Local Government Board, and as it is rather a short memorial I should like to read it. I might say that a committee, composed of members of both sides of the Board, was appointed to draw up this memorial, and that this memorial was adopted unanimously.

" The Guardians of the Leicester Union desire to lay before your Honourable Board the extraordinary circumstances which have arisen in regard to the Vaccination Acts in Leicester.

" The paragraph contained in your letter of September 4th, 1883, relating to the Guardians' duties under Article 16 of the Local Government Board's Order of October 31st, 1874, intimated that proceedings were to be taken so as to enforce conviction in each case of default under the Vaccination Acts.

" On October 5th, 1883, the Guardians, by the casting vote of the chairman only, authorised their Vaccination Officer to take proceedings against 996 persons, who were at that time defaulters under the Acts. The result of these prosecutions was to send 21 parents to prison, the sale of household goods distrained from 86 homes, amidst great disturbance and riot, necessitating the presence of a large police force, under the Chief Constable, for the maintenance of the public peace. Whilst nearly the whole of the remainder paid the penalties imposed by the magistrates, only 82 out of a total of 996 reluctantly allowed their children to be vaccinated under pressure of the law.

" The Guardians submit the primary object of the law being the vaccination of children and not the

" prosecution of their parents, that object is not attained by the proceedings which they have taken by your instructions.

" On the other hand, these numerous prosecutions tend to bring the administration of the law into contempt, and by inflicting great hardships they have in many instances excited the sympathy and indignation of the public. Some of the Leicester magistrates reluctantly impose penalties and express sympathy with the defaulters.

" The opinion largely prevails in medical and other circles that a less rigorous administration of the law would result in an increased number of vaccinations.

" The Guardians object to be the instruments of carrying out a law which they believe is opposed to the spirit of the age, and they trust that they may be relieved from such duty pending the probable repeal of the statutes (vaccination).

" There is no small-pox in Leicester, and the few isolated cases during the past 11 years have been imported from so-called protected districts.

" The following is an extract from the annual report of the Medical Officer of Health for the borough or 1883:

" 'Since 1873 up to the present time, an interval of 11 years, the town has enjoyed an almost complete immunity from the inroads of the disease' (small-pox). 'In the last seven years there have been no fewer than 17 importations of small-pox into the town. Notwithstanding this large number of importations the disease has always been stamped out, and the town thus saved from the distress and mortality which have hitherto accompanied its prevalence.'

" The Guardians wish to point out that the distress and mortality here referred to were prior to 1873, when vaccination was full in practice while the means since resorted to with such uniform success have been isolation of patients, disinfection of their homes, with the adoption of general sanitary precautions, and in no case vaccination.

" They also wish to state that this success has been attained in the midst of an increasingly unvaccinated population.

" The enclosed return shows that the opposition now embraces more than half the population, only 1,732 being vaccinated out of 4,819 births for the year 1883.

" When questions upon the Vaccination Acts have been submitted to your Honourable Board it has been the invariable custom to refer inquirers to the letter addressed to the Evesham Board of Guardians in 1875. The Leicester Guardians feel that that letter is altogether inadequate to their present inquiry, as it relates to one individual, whilst in Leicester the prosecutions already carried out since 1873 according to the enclosed return amount to 2,679; and the same return gives 1,906 defaulters for 1883 in addition to the number accumulating this year, making a probable total of 3,000 in all to be dealt with.

" Under the circumstances enumerated, the Board are of opinion that the intention of the framers of the Acts as well as the requirements of justice and the public health would be fully carried out if they instruct their Vaccination Officer not to proceed beyond the delivery of Notice A., and they respectfully ask that the instructions given them may be modified to that extent."

This was moved and seconded, and, as I said before, carried unanimously.

13,629. (*Dr. Collins.*) When you speak of numerous prosecutions bringing the law into contempt, do I understand you are referring there to prosecutions in the aggregate, and not to multiple prosecutions in individual cases?—I am not referring to multiple prosecutions in individual cases, but to the large aggregate of prosecutions which were then taking place in Leicester.

12,630. (*Chairman.*) That memorial was replied to upon the 18th of November of the same year, was it not?—Yes.

13,631. The Board did not enter into any discussion of the policy of the Acts, or the general question of vaccination?—No, they simply stated that they had no power to relieve the Guardians from the obligation which the Legislature had imposed upon them of enforcing those Acts; that is the principal point of their reply.

13,632. What is the next matter to which you would call attention?—These memorials will sufficiently

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indicate the attitude taken by the Board, and I should like to observe here that the Board, which was elected in 1882, was really a Board opposed to prosecutions; but they continued, as I have shown, to carry out prosecutions, more or less, till 1886. However, I think these memorials sufficiently indicate the feelings of the members of the Board on both sides, as the memorial I have just read was drawn up with the concurrence of both sides, showing that those in favour of prosecutions were practically tired of the work they had to perform. There is one other matter which illustrates the feeling of the Board, which I will now allude to, that is, the salary of the Vaccination Officer. This matter has given rise to an enormous amount of correspondence between the Leicester Board of Guardians and the Local Government Board, and I should state here that the principal part of that correspondence has been eliminated from the documentary evidence which the Guardians have already laid before the Commission. When the Vaccination Officer was first appointed, on the 24th of July 1868, his remuneration was to be 4*l.* for each registered case of successful vaccination, and I see that in that year, his salary from those fees was 30*l.* 14*s.* 6*d.* His remuneration was raised to 5*l.*, upon the 10th of May 1870, and it was raised finally to 6*l.*, at which it now stands, upon the 19th of December 1871, and looking at the fees he has received, I find that in 1869 he received 59*l.* 6*s.* 8*d.*; in 1870, 61*l.* 9*s.* 9*d.*; in 1871, 67*l.* 5*s.* 10*d.*; in 1872, 112*l.* 4*s.* 6*d.*; in 1873, 92*l.* 6*s.*; in 1874, 94*l.* 1*s.* 7*d.*; in 1875, 88*l.* 9*s.* 6*d.*; in 1876, 85*l.* 13*s.*; in 1877, 91*l.* 6*s.* 6*d.*; in 1878, 84*l.* 6*s.*; in 1879, 78*l.* 13*s.*; in 1880, 72*l.* 3*s.*; in 1881, 85*l.* 8*s.* 6*d.*; in 1882, 77*l.* 13*s.*; in 1883, 48*l.* 19*s.*; and in 1884 his salary fell to 44*l.* 1*s.* 6*d.* He made an application for an increase of salary, and after a long discussion, I think, a resolution was moved to give him 100*l.* a year fixed salary, to which an amendment was carried to give him 90*l.* This matter was referred to the Local Government Board, but they stated in a letter, which is amongst these memorials, that they could not allow any Board to pay officers by a fixed salary; it must be by fee. Under these circumstances, after a very long discussion with the Local Government Board, a compromise was arrived at, and the Board agreed to allow the Leicester Board of Guardians to pay their officer a salary of 30*l.* a year, in addition to his fees. Even under these circumstances, the falling off in his salary continued and the Vaccination Officer applied to the Board for a gratuity, and a gratuity was granted to him in 1885 of 20*l.* 11*s.* 6*d.* A little later on he applied for further gratuity, but after the first gratuity had been paid a letter came from the Local Government Board stating that the gratuity was illegal. This is a rather remarkable letter, dated the 24th of June 1885: "Sir, "I am directed by the Local Government Board to "acknowledge the receipt of your letter of the 20th "ultimo requesting their sanction to the payment by "the Guardians of the Leicester Union of a sum of 20*l.* "to Mr. W. H. Maskell, Vaccination Officer, in con- "sideration of the extra services rendered by him under "the circumstances mentioned in your letter." "In reply, the Board direct me to state that since on a "previous occasion they sanctioned an additional pay- "ment to the Vaccination Officer on account of similar "services, they have had occasion to consider, generally, "the question of such payments, and they have been "advised that it is open to doubt as to whether the "General Orders relating to the appointments and re- "muneration of these Officers admits of such payments "being made. "Under these circumstances, and with the view of "enabling the Guardians to carry out their proposal, the "Board have issued an Order making such an addition "to the regulations as far as this Union is concerned as "will authorise them under special circumstances to "approve of the payment of extra remuneration to the "Vaccination Officer. Two copies of the Orders are "enclosed for the Guardians, and one copy for the "Vaccination Officer. "If the Guardians will now be good enough to pass a "further resolution on the subject and will forward a "copy to the Board, the Board will be prepared to "sanction the payment."

That is rather a remarkable state of things. Here was a case where a special Order was made to enable the Board to make up by gratuities the falling off in the vaccination fees. Eventually a further resolution was carried and was sent to the Local Government Board, and I see from a table before me that the Vaccination Officer has had in gratuities the following sums: He had in 1885, 20*l.* 11*s.* 6*d.*; in 1886, 16*l.*; in 1887, 25*l.*; in 1888, 30*l.*; in 1889, 30*l.*; and in 1890 he received

26*l.* 12*s.* Those were all gratuities. The circumstances were exceedingly anomalous, because there is scarcely a member of that Board who believes in the system of paying by gratuities. The order for these gratuities and the grant of the last gratuity is followed by a resolution carried by almost an unanimous vote that no further gratuity should be granted. The falling off in fees from the time the gratuities were granted is as follows: In 1885 the amount received by fees was 36*l.* 1*s.*; in 1886 the amount was 28*l.* 1*s.*; in 1887 the amount was 11*l.* 15*s.* 6*d.*; in 1888 it was 7*l.* 17*s.*; in 1889 it was 4*l.* 6*s.*; and in 1890 it was only 3*l.* 5*s.* 6*d.* When we consider that in one year, 1872, a sum of 112*l.* 4*s.* 6*d.* has been paid in fees, and that it has now fallen to 3*l.* 5*s.* 6*d.* (1890), I think that of itself is a sufficiently emphatic proof that Leicester has rejected the practice of vaccination.

13,633. Does that conclude the proceedings of the Guardians to which you wished to call attention?—There is just one other matter in the new table which I have mentioned this morning to which I should like to point. For the half year ending June 1890, 2,432 births were registered, and of those only 60 are registered as being successfully vaccinated. I want just to call attention to the number who have been vaccinated, out of the 60, by the Public Vaccinators; it is only four. In the earlier years given in the tables handed in by Mr. Chamberlain, Table C, it would of course be possible to base per-centage calculations as to the number vaccinated by public and private practitioners; but when the numbers have become so small I think it would be altogether out of character to make any such calculations, because in one year the number, I notice, falls to 39 private vaccinations. Of course it has slightly increased since, but there is a general feeling on the part of parents, not only those who have their children vaccinated by the Public Vaccinator, but also on the part of those who engage private vaccinators, against their children being vaccinated at so early an age. I have made some inquiries upon that subject since I came before the Commission last week, and I find the feeling is almost universal. Parents protest against the vaccinations being performed at so early an age.

There is one other circumstance which occurred while I was on the Board which I should like to allude to. At the time when prosecutions were being carried out against me, and my goods were being sold, there were one or two gentlemen in the Board room who had children much older than mine against whom no proceedings were instituted. I have taken the opportunity of seeing those gentlemen, and I know that from time to time they obtained medical certificates in regard to their children; but I am quite sure that the child for whom I was being prosecuted was in no better health than their children for whom they were not being prosecuted. I raised this matter on the Board during the debates and elicited no reply; and I do not know now why I should have been proceeded against whilst there were at least two others there who were not proceeded against.

13,634. That would be explained by the fact that they obtained medical certificates whilst you did not?—Yes, they obtained medical certificates whilst I did not; that was so.

13,635. (*Dr. Collins.*) The medical certificate lasts at its maximum for two months, does it not?—I do not know its duration.

13,636. (*Mr. Meadows White.*) Do you know the medical men who gave the certificates?—I do not.

13,637. Did you inquire?—I did not, but I know that the vaccination of these children was postponed five or six years, and from the statements of the parents themselves, it was their desire to put off the vaccination to a later age in life, at which time it was possible that if any ill effects did arise the result would be less serious.

13,638. (*Chairman.*) Does that cover the whole of the case you wished to put before the Commission with regard to the proceedings of the Guardians?—It does.

13,639. What is the next head under which you wish to bring forward any evidence?—The next head that I wish to refer to will be the prosecutions which have arisen out of the action of the Board of Guardians. The history of vaccination in Leicester contained in the important official documents already presented by the Board of Guardians to the Royal Commission illustrates one side of the working of the Vaccination Acts, while the records of the Leicester Borough Police Courts from 1868 to 1886 furnish another view equally important and extensive. The desire of the Guardians to act in



accordance with the requirements, or even the supposed requirements, of the law in authorising prosecutions was equalled at least by the determination with which the magistrates proceeded to pronounce the penalties attached to any breaches thereof. These again were supplemented by the alacrity of the police authorities in executing the mandates of the magisterial bench. In the early days of prosecutions scant sympathy was shown to those who ventured to oppose their conscience to the requirements of the law. An anti-vaccinator was regarded as an outlaw and treated as little better than a fanatic. The administration of justice was rarely tempered with mercy. The uncertainty prevailing in the legal mind as to the exact meaning of the statute prevented any actual sentences being inflicted in the year 1868, which was the first year of prosecutions. Two persons only were summoned in that year, although one, Mr. George Saddington, had to appear before the Bench twice through an adjournment of his case. He subsequently went to prison. But in the following year, 1869, these doubts or scruples were set aside and eight fines of 20s. each were imposed on eight different persons, while two of the parents who were unable or unwilling to pay the fine were actually sent to prison for a term of 10 days each. The prosecutions thus commenced in 1868 increased to 12 in 1869 and to 24 in 1870. In 1871 there were 15 prosecutions; but in 1872 they again increased to 49. In all there were between 50 and 60 proceedings before the magistrates, including ten imprisonments, before the Act of 1871 came into operation. Prosecutions continued until in 1876 they had reached over 100 in the year. The climax was arrived at in 1885, during which year nearly 1,300 proceedings took place before the magistrates. The details and the grand aggregate of these prosecutions, which unquestionably assumed gigantic proportions, are probably unrivalled by those of any other town in the kingdom, or by any like details under any other British law. It is wonderful, indeed, that any community should have borne so patiently a mass of suffering and privation such as these prosecutions reveal, and should have borne it too without a much greater and more serious disturbance of the public peace than any which actually occurred. This fact offers the strongest possible testimony to the peaceable, orderly, and law-abiding character of the Leicester people; and it is only fair to them that this fact should be recorded here.

13,640. Can you give the Commission the extent to which fines were imposed?—During the period covered by these proceedings no fewer than 3,651 fines under section 29 of the Act of 1867, amounting in all to 1,922l. 9s., were imposed upon Leicester people. Out of this great number of persons fined, 274 had additional costs to pay, representing a further sum of 192l. 8s., being a total under this head of 2,114l. 17s.

13,641. Then what number of orders were made under section 31?—Orders were made under section 31 in 984 cases with costs, amounting to 197l. 2s., while 131 orders were for various reasons issued without costs. The total number of orders to vaccinate under section 31 was 1,115, the time allowed being usually limited to one month. (See Question 13,664.)

13,642. (Mr. Meadows White.) Have you any evidence to show whether there were any second orders issued in any case under section 31?—There were no second orders; those were all first orders arising from the arrears into which the work of the Vaccination Officer had fallen.

13,643. (Chairman.) To what extent were cases postponed or dismissed?—There were altogether 997 postponements and dismissals, but few, very few, certainly not more than 20, of these dismissals were owing to the merciful consideration of the presiding magistrates exercising the discretionary powers conferred by the law. These cases were dismissed on account of the parents pleading some injury or death as having already occurred in their own families or in their own experience through vaccination. Although the Act of 1867 especially empowers magistrates to exercise their discretion in dealing with defaulters, in many instances, notwithstanding cases of a painful nature (such as previous injuries through vaccination) were laid before the Bench, yet in most of these cases the pleas of the parents were entirely disregarded. Some of these 997 cases were dismissed on account of vaccination having been carried out after proceedings were initiated; and others were dismissed on a promise being given by the parents to have the operation performed when the children were in a suitable state of health, while the postponements were usually made when medical certificates were produced.

13,644. What proceedings were taken in the event of nonpayment of fines and costs?—Distress warrants were issued in no fewer than 193 instances to recover various sums amounting to 92l. 18s. Two of these warrants were issued against a member of the Board of Guardians who had taken a prominent part in the agitation against the compulsory law.

13,645. (Mr. Meadows White.) Were those distress warrants issued because the persons had no means to pay the penalties or because they had declined to do so, resisting the sentence imposed by the law?—Simply because they declined to pay on conscientious grounds. The sales did not prove very remunerative. Only a sum of 76l. 4s. was recovered, thus leaving a deficiency due to the authorities of 16l. 14s. This in all probability may now be regarded as a bad debt.

13,646. (Chairman.) Was there much difficulty experienced in carrying out the sales?—The police authorities experienced great difficulty in obtaining the services of an auctioneer. No local man of any repute would undertake the disagreeable task, and it is well known that nearly all the auctioneers in the town declined the overtures of the police. Recently in a county sale the only local man the authorities could induce to undertake the work failed to keep his engagement; and in other county sales just on the borders of the borough a man, protected by a strong body-guard of police, was brought from Birmingham because no local auctioneer could be found to perform such work. The sales were frequently carried out under great difficulty. They caused tremendous excitement, and on some occasions about half or more than half of the police force of the borough was required to enable the auctioneer to proceed with his work. Indeed the resources and energies of the Chief Constable were often taxed to the utmost. Each sale was the occasion of a demonstration against the compulsory law. Sympathy was excited and expressed with those who suffered, until many of those in authority, including chief magistrates and other occupants of the magisterial bench, Aldermen, Town Councillors, Guardians, and nearly all other classes of the community became opposed to the compulsory enforcement of the vaccination law.

13,647. Were there many cases of imprisonment?—There have been between 60 and 70, I believe. Since the Summary Jurisdiction Act, which came into force, I think, in 1879, there have been fewer imprisonments, because that Act provided for the sale of any effects which the person might possess. To my mind the saddest feature of all is the imprisonment record. Some who were able to pay the fines imposed could not conscientiously do so, and thus compound with what they felt to be an unjust and tyrannical law. Others were compelled to go to prison through stress of circumstances and inability to pay the fines. Whatever the determining course, it was felt that there must be something intrinsically wrong about a law which compelled between 60 and 70 parents to suffer the indignity and privations of a felon's cell. Two of these were women. The deceased husband of one of them (Mrs. Wrigley) had been one of the first opponents of the compulsory law in 1869. Both Mr. and Mrs. Wrigley were highly respected members of society. The terms of imprisonment varied considerably. The friends of several of the prisoners, being unable to endure the thought of their incarceration, paid the fines for them, and so obtained their release, as in the cases of Mrs. Wrigley, Mr. Amos Booth, and others. In these instances the terms of imprisonment varied from a few hours only to a few days.

13,648. Was there any change made at any time in the term of imprisonment inflicted in default of payment of the fine?—Down to the year 1879 the alternative of the non-payment of a fine was imprisonment. As the fines imposed from 1869 to 1876 were usually 20s. the correlative term of imprisonment was 10 days. Many deputations, including one from the Guardians, waited upon and urged the magistrates to reduce the fines, but it was not until November 3rd, 1876, when Alderman Barfoot was Mayor, that, after repeated refusals to lower the amount of the fines, the bench did unexpectedly reduce them to 10s., the corresponding term of imprisonment being seven days. After this all attempts to obtain a further reduction proved entirely unavailing. With the Summary Jurisdiction Act of 1879 a change was effected. Under this Act Justices were enabled to impose fines, and in default of distress to order imprisonment. This accounts for the partial cessation of imprisonments for a few years, and the issue

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of distress warrants instead. Owing, however, to the small amounts realised at the distress sales, many defaulters, whose goods were estimated at a value insufficient to realise the sum required, were arrested and taken to prison. Some of the prison experiences are certainly not pleasant reading, but several of them are well worth recording. One of the first men who went to prison in Leicester was a man of weakly constitution named Isaac Goude, who suffered from asthma. The harshness of his treatment, in addition to the coldness of the cell in which he was immured, is stated by his wife to have so far affected his health that, although he lived for some time afterwards, he never quite rallied from the shock his system received; and his friends largely attribute his subsequent decease to the effects of this imprisonment. Another man, Mr. Frank Palmer, was striving hard to establish a business. He was not a man of robust health, and the worry, anxiety, and loss consequent on law proceedings occasioned by three appearances before the Bench, in addition to three separate terms of imprisonment, seriously affected his business prospects and added greatly to his difficulties. How far these imprisonments permanently affected his health it is impossible to say.

13,649. (*Mr. Meadows White.*) Within what interval were those three imprisonments?—I believe those three imprisonments took place within two years. His wife states that the effects were serious at the time, and, having a young family, inflicted a great hardship upon them. He has now been dead several years. In another instance Mr. George Frith had four days added to the usual sentence of imprisonment, making 14 days in all, for speaking out in his defence at the court.

13,650. (*Chairman.*) Can that be so; it could not be added to that nominally; was it for contempt of court?—At that time the usual sentences imposed were ten days. Mr. Frith spoke up to the court in his own defence. I cannot say whether his defence was regarded as contempt of court or not, but upon making his defence he had 14 days imposed upon him.

13,651. Do you know whether he may have used language insulting to the tribunal?—I do not think he did.

13,652. (*Mr. Meadows White.*) Were you there?—I was not there at the time, but I understand he intends to come here as a witness. When in prison, while smarting under the imposition of these extra four days, and what he considered to be undue harshness and indignity in his treatment, he happened to speak somewhat sharply in reply to the warders of the prison, and they at once thrust him into the "black hole" for a few hours, as a punishment for his independence of spirit. In short, at that time it appeared to be a common practice to inflict every possible degradation upon a prisoner, if only the subject of the treatment happened to be an anti-vaccinator. Another arrest was that of a man named William Ball. As the police arrived he was just hearing the prayers of his children before they retired to rest. He at once accompanied the officers of the law to the gaol. Being a Sunday school teacher his class decided, on learning where he was, to meet him and give him a hearty welcome. On his release hundreds of people assembled to meet him, and in the evening of the same day a demonstration and public meeting was held in the market-place, at which several thousands of people were present. There was one case of imprisonment, reference to which ought not to be omitted. It is that of a nephew of the late Alderman Thomas Norman, of Leicester; namely, Mr. Henry Matts, whose imprisonment as an anti-vaccinator was the fourth in order of time in regard to the imprisonments in Leicester. He is an old inhabitant of the borough, and commenced business in Leicester as far back as the year 1850.

13,653. (*Chairman.*) What was there specially remarkable about his case?—One of the peculiarities of the Vaccination Act of 1867 was this: that, unlike Acts of Parliament generally, one of its clauses, the 31st, was construed to be retrospective. It is doubtful, to my mind, whether the Legislature, when passing this Act, intended it to have this effect.

13,654. (*Mr. Meadows White.*) In what way was the Act retrospective; was there an order made upon Mr. Matts in respect of this child because it was not vaccinated?—His three children were born before the Act of Parliament was passed.

13,655. That is the retrospective action you speak of?—Yes, that is the retrospective action I speak of; they were born years before the Act was either put into

operation or even framed. Mr. Matts was sentenced to three consecutive terms of imprisonment of 10 days each on account of his three children, aged 7, 9, and 12, and he suffered 30 days' imprisonment at one stretch, and this in the cold season of 1871. Shortly before his incarceration an Act had been passed to put an end to the practice of cropping and shaving prisoners, excepting for purposes of cleanliness. Yet in spite of this the most determined efforts were made to compel Mr. Matts to submit to this operation. Having a fair growth of hair and profuse beard, Mr. Matts naturally resented the attempt. At length, after several ineffectual efforts to compel him to submit, the principal warder threatened to use physical force, and so eventually the outrage was effected, though under the strongest protest, Mr. Matts believing it to be one of the regulations of the gaol. After Mr. Matts' release from prison his solicitor, the late Mr. Reeve, Justice of the Peace for the borough and Clerk of the Peace for the county, indignantly protested against the injustice which Mr. Matts had suffered, and urged him to prosecute Mr. Edward Marshall, the governor of the prison. With rare generosity and forbearance Mr. Matts declined to do so on the ground that the governor and he had known each other for many years, and he was reluctant to prosecute an old acquaintance. An apology from the governor, given in the presence of the Mayor, Alderman Stafford, and other magistrates, was all that was asked for and received. Some of the anti-vaccinators who went to prison complained of ill-fitting garments, which were covered with patches, and also of trousers without brace buttons, the means of obtaining them being refused. These, however, with many other annoyances were among the common incidents of gaol life to the unfortunate anti-vaccinators.

13,656. (*Chairman.*) What has been your experience in Leicester in regard to the infliction of cumulative penalties?—Leicester has never suffered very much from cumulative penalties, although in various Unions great hardships have been endured, and a vast amount of suffering has been caused by the infliction of repeated fines upon the parents for the non-vaccination of the same child. In Leicester, however, out of the great number of proceedings, only one cumulative penalty was insisted upon by the Board of Guardians, and that was in the case of Mr. John Millington, who was fined 20s. a second time shortly after having paid a previous fine of 20s. for the same child and the same offence.

13,657. (*Mr. Meadows White.*) There was a second order by the magistrates?—Yes.

13,658. The offence was disobedience to the second order?—It was in respect to the same child. The only other case akin to a cumulative prosecution was that of Mr. John Deeming, who was sent to prison for five days in default of paying costs under an order to vaccinate. He subsequently served a term of seven days in prison. Both these imprisonments were the result of proceedings in respect of one child.

13,659. (*Chairman.*) You have ascertained the total number of prosecutions and the total amount of the fines inflicted, I believe?—Yes; I have. The prosecutions amount to the enormous number of 6,037. To this number must be added several hundreds of adjournments not tabulated in the record which I have here, but recorded in the official journals, thus making the colossal aggregate of about 7,000 proceedings against anti-vaccinators in the Leicester borough police courts.

13,660. Those would not be all anti-vaccinators; some of them would be against non-vaccinators, would they not?—I do not know what distinction we could draw between one and the other.

13,661. An anti-vaccinator, I understand, to be one who opposes vaccination; a non-vaccinator may be one who has merely neglected it without any feeling of opposition?—Accepting that distinction, there no doubt were some with whom it was a matter of neglect.

13,662. (*Mr. Meadows White.*) Could you tell me whether you have counted the appearance of the parent before the magistrate upon the making of the order and the subsequent proceeding for the penalty as two proceedings or one?—As two proceedings.

13,663. Under the 31st section a parent is brought before the magistrate and an order is made, and the proceeding for penalty is a subsequent proceeding?—Yes; we have counted them as two, and they would be regarded as two by those who had to appear, because they would have to lose half a day's work, perhaps, on each occasion.



13,664. (*Chairman.*) Now will you tell us the amount which has been paid in fines and costs?—The total sum of hard-earned cash which has been extracted principally from the pockets of working class defaulters in Leicester amounts to 2,388*l.* 3*s.* In the earlier years, as I have already stated, the fines imposed were 20*s.* in each case. This was afterwards reduced to 10*s.* The cost of orders varied from 1*s.* and upwards, but was usually 4*s.*, while non-appearance at court in answer to a summons was punished as contempt of court by the infliction of an additional fine of 7*s.* or 8*s.* Taking into consideration the loss of time and work in attending the courts, the loss and distress occasioned by the fines (often inflicted in hard times), the loss and expense through distress warrants, and the still greater loss and trouble caused by terms of imprisonment, we may fairly estimate that each separate proceeding would cost anti-vaccinators on an average not far short of 1*l.* We thus approach a monetary loss equivalent to between 6,000*l.* and 7,000*l.*, resembling a poll tax inflicted by these vaccination laws for the most part on the industrial population of Leicester. All this is exclusive of the considerable cost and great anxiety to the authorities, to say nothing of the alleged infliction of diseases in many instances. Allowing an average of five to each family, we can in some measure gauge the mass of suffering which has been entailed upon about 30,000 of men, women, and children in the borough of Leicester. I have before me the details of upwards of 6,000 prosecutions, together with a table, which I will hand in, giving a classification and summary based upon these cases. (*The table was handed in. See Appendix III., Table 1; page 415.*) The cases include ministers of religion, members of the Town Council, members of the Board of Guardians, representatives of the medical and kindred professions, manufacturers, schoolmasters, representatives of the press, and, indeed, almost every class of the community. I should like now to read a letter which was addressed to me by the Chief Constable. On the 24th December, 1889, he addressed this letter to me:

"Dear Sir,

"I beg herewith to forward the vaccination returns prepared by Inspector Howe, as requested in your letter of the 27th of November.

"I am, dear Sir,

"Yours respectfully,

"JAMES DUNS,

"Chief Constable."

The letter of Inspector Howe reads as follows:

"Inspector's Office,

24th December, 1889.

"Sir, "I beg most respectfully to hand you herewith a return of the number of persons proceeded against under the Vaccination Act, as shown by the records of the Leicester Borough Police books, from the year 1868 to 1889.

"The return shows that 6,037 persons have been proceeded against. Of this number 997 were dismissed, 1,115 ordered to have their children vaccinated, and 3,925 fined, of whom 274 were ordered to pay costs, varying in sums amounting respectively from 1*s.* up to 2*l.* 11*s.* The amount of fines, together with costs, amount in the aggregate to 2,114*l.* 17*s.* 193 distress warrants were issued for 92*l.* 18*s.*, with the result that the amount of 76*l.* 4*s.* was recovered. 57 persons were committed to gaol in default of payment of fines or costs, three of these suffered three terms of imprisonment each, and one of them was imprisoned twice, making a total of 64 committals. Between three and four hundred of those proceeded against appeared before the magistrates from twice up to five or six times before a decision was given, and which are only recorded in my return as having appeared once. I am unable to give the number of policemen engaged in the execution of distress warrants, it having been done by the summoning officer with such assistance as he required from time to time.

"Mr. Frank Radford, Eriar Lane. (deceased), and Mr. Fred. Johnson, Erskine Street, have been the auctioneers at all the sales which have taken place, their bills of costs are now in the possession of Mr. Blackwell, magistrates' clerk. The number of policemen engaged at auction sales have been on the average 30.

"I am, Sir,

"Your obedient Servant,

"JOSEPH HOWE,

"Inspector."

That is addressed to the Chief Constable.

13,665. The book you have handed me with the table contains a list of every one of the persons prosecuted with their names, addresses, callings, and the result?—Yes, every particular is entered in that book, with the presiding magistrates and terms of sentence.

13,666. Does that finish the part of the case dealing with prosecutions?—That is only one sub-division; I have several other sub-divisions of this subject. I was going to refer for a moment to the summary which I have just handed in. The letter of Inspector Howe explains that he has left out, according to his own figures and calculations, some 1,000 to 2,000 proceedings which have taken place before the magistrates which are not recorded in this book; those would be upon the adjournments of orders and prosecutions; he thought that if he recorded the orders, and in some instances the first adjournment, that would be sufficient for the purpose of this return. Last week, when your Lordship was looking at this summary in connexion with the vaccination return of the Guardians, some allusion was made to the number of cases proceeded against, which appears in the first column; and, taking the year 1882, in the first column it states that the number proceeded against was 918; your Lordship referred to the number that were fined out of the number proceeded against as being 691. I do not know whether you noticed that the whole of the number were dealt with in some way or other, although only that number of fines were inflicted; you will observe in other columns that a certain number were dismissed, namely 143, who would be called up again subsequently under those orders to which Inspector Howe alludes; they would be disposed of ultimately in some way or other, probably by the infliction of a fine; if they had not been disposed of in that way they would not have appeared under this head as the "number proceeded against." The number who went to prison is also carried out in a separate column, and in one part of the book I have handed to you we have given a list of the imprisonments.

13,667. What is the next point to which you wish to refer?—It comes under the same head, but is a further sub-division of it. Cases of hardship and imprisonment are what I should like to refer to now. On the 27th of October 1883, a case of hardship arose in respect to a defaulter under the law named Charles Bromley; he had had a fine imposed upon him some 12 months before, and the child subsequently died.

13,668. Is it proposed that he should come as a witness?—No, he is in America now; he was a very poor man, but exceedingly respectable. Some police officers visited his home for the purpose of ticketing the goods. I brought this matter before the Board of Guardians, who did in that instance withdraw the prosecution out of sympathy with the defaulter.

13,669. (*Sir Charles Dalrymple.*) How is that a case of hardship?—It did not eventuate in a case of hardship, but if they had sold his goods it would have been exceedingly harsh.

13,670. It was rather the reverse, was it not?—It was rather the reverse in the end, but the expectation of trouble would be bad enough. There was another case of a man named Roseblade; these are all cases of possible hardship, and some of these really come to hardship. This man is a cripple; he was summoned before the magistrate; he was entirely unable to pay the fine; he was unable even to attend the court through illness. A fine was imposed, and, according to the custom of the Court of imposing additional costs for non-appearance, which I presume was called contempt, a further sum of 7*s.* 6*d.* was added to the already imposed fine of 10*s.* Upon the 13th of December 1883 three policemen called at his house, and his wife, who at the time was very near her confinement, entreated them to stay while she was endeavouring to obtain the money, as she did not wish her husband to go to prison. She being unable to obtain the money, and the police being unwilling to wait any longer, they took Roseblade off to prison. He could come, if necessary, as a witness, but he is an exceedingly nervous man. He described to me the sufferings he passed through that night in the prison cell; he was released the next morning; his wife had pledged some of her clothing and her wedding ring to release him. Upon the 1st of January 1884, further proceedings were started against him; one of his children had a fall and injured his leg; he seemed to be a man of whom it might almost be said that he was pursued by misfortune at the time. I mentioned this case to the Board of Guardians. In this case it had been a real hardship at first, and would have deve-

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loped into one again. He is a man who has held good situations for seven, eight, and one years respectively, and has certificates of good character, but through being a cripple he is unable to obtain any regular employment, and obtains his living by writing tickets for shop windows. As I say, I mentioned this matter to the Board, and it is only right that this should be recorded, that this Board which had a majority of prosecutors upon it, and which ordered his prosecution, subscribed a sum of money which I had the pleasure of handing to him, and which, in the second instance at any rate, relieved him from the difficulties under which he was suffering. Here is another instance, that of a man named Goodfellow. Someone had addressed a letter to me with regard to this man, saying that his goods had been seized, and that amongst the goods a sewing machine had been ticketed which was the only means with which the wife had to obtain a living for her husband and family. I mentioned this case to the Board of Guardians, and it appeared when the circumstances were fully known that the summoning officer had been to the house to ticket the goods, and that he had, on learning what the circumstances were, withdrawn, but only on condition that the fine was paid before a certain time. However, before that time expired, I know that steps were taken, without knowing exactly what steps, to prevent the sewing machine being taken away. Although I have classed that under the head of "hardship," and although it may be observed that no hardship ensued, yet I mention these cases to show what may have occurred in many instances without our knowledge. But for the circumstance of someone having sent a letter to me in this case, and but for the circumstance of having some information respecting the case of Bromley, there is no doubt great suffering would have ensued in both those families. Then there is the case of a man named Eagle.

13,671. (*Chairman*.) Is there any advantage in multiplying these instances?—I have only this one. He had a distress warrant issued upon his goods on May 7th, 1887, and the fine and costs amounted in all to 22s. 6d. On May 27th the policeman came to his house, and declared that the goods were not of sufficient value to issue a distress warrant upon, but he has since had a valuation of the furniture, and it has been valued at some 12l. or 14l. A warrant of committal was issued, and he was arrested at the unseemly hour of 1.30 a.m. The police climbed over his garden wall, assailed his house, called him out of bed, handcuffed him, and hurried him off to prison.

13,672. (*Mr. Picton*.) In 1887 had not the prosecutions entirely ceased?—I am referring to a case which occurred in Belgrave, which is just outside the borough, a prosecution by the county magistrates. I may observe that we propose to call a few witnesses from the county as well as from the borough; but the man having been a county man, and having been handcuffed on his arrest, I thought it only right to mention the treatment he received. I do not propose to go further into the case of Mr. Eagle, as I think it possible he may attend here, and give evidence on his own account. I cite those instances to show that in a large number of prosecutions, such as those I have laid before the Commissioners this afternoon, amounting to more than 6,000, there must have been an exceedingly great amount of suffering caused by the operation of the law; and I think if I cite only three or four instances out of a large number I cannot be exactly taken to task for bringing an excessive number of cases before the Commissioners.

13,673. (*Chairman*.) What is the next class of cases you propose to bring before us?—I should like to refer now to some excessive distrains which have been carried out in Leicester. There have been a large number of sales of furniture, but there are one or two instances of seizure by the police which have been excessive. In one instance, Mr. Pratt's, a bookcase was taken, the value of which was ascertained to be about 12l. or 14l., while the fine and the cost of levying the distress only amounted to 12s. In that instance the costs of carrying out the sale were run up to between 3l. and 4l., and Mr. Pratt, a man who is in fairly good circumstances, entered an action against the police for 7l. damages. The matter came on in the County Court. In summing up the case His Honour observed: "What possible defence could there be to taking goods of the value of 3l. to satisfy a fine of 10s.?" Not that he believed the goods to be of the value of 3l., for he was inclined to take the view of Mr. Newberry and say that they were "worth 12l. or 13l. But supposing the goods were only

"worth 3l., what justification could there be in seizing 3l. worth for 12s.?" Then it was said it became necessary, because it was known that there would be a row at the sale, and that the things under such circumstances would not fetch much money. All that he could say was that he was perfectly shocked to hear such a plea as that put forward. That because they anticipated a riot they were to seize goods to that amount in order to realize 12s. was a most monstrous thing, and he thought the police were in this case quite defenceless. He should give judgment for the plaintiff for 7l., the amount claimed." Then there was another instance of excessive distraint, the case of Mr. Charles Lunn; that was outside the borough. In this case the total amount of goods seized, according to a very low estimate put upon them, was 21l. 7s., and one of the articles ticketed was a vase, which on the day when the police effected an entrance (which they had to do forcibly) was missing, and it led to an action on the part of the police against Mr. Lunn, for the sum of 4s. 6d., by which sum the amount for which they had distrained was short, that is to say the goods realized 4s. 6d. less than the amount for which they had distrained. This action resulted in the dismissal of the case, because Mr. Lunn was able to prove that he knew nothing whatever about the removal of this vase, and that he placed the matter in the hands of the police as soon as he had ascertained where it was hidden. There is one other case to which I should like to refer, and I only refer to this because unfortunately the man, Mr. Robert King, died, under rather painful circumstances, suddenly on last Christmas morning. He had intended to come before the Commission, and it was an exceedingly painful case, but not the only one of a similar kind that I have known in Leicester or the neighbourhood. Mr. King lived in the Mere Road, Leicester, in the district of New Evington. One side of Mere Road is in the borough, and the other side in the county; and if Mr. King had lived on the borough side no proceedings would have been taken against him at all, but having the misfortune to live on the county side, these proceedings were taken. After he had been summoned before the magistrates, and a fine imposed, the child died, and a year afterwards elapsed before the authorities took any proceedings against him, and I believe that the anniversary of the child's death was the day of the sale.

13,674. Do you mean that the child was dead when the proceedings were first taken?—The child was living at the time when proceedings were first taken; but after a fine had been inflicted a year elapsed before the authorities took any steps, or rather more than a year, because the child afterwards died, and it was 12 months from the day the child died when these proceedings were taken. However, there was an enormous crowd of people assembled; I was present at the sale; there was a general feeling that, under the circumstances, the authorities might have waived the proceedings; they failed on that occasion to carry out the sale. The auctioneer did not put in an appearance, and the sale was adjourned. Afterwards they obtained the services of an auctioneer from Birmingham, as they could not persuade any local man to undertake the task, and the sale was carried out under these circumstances. Mr. King refused them admittance to the house, the door was broken open by a crowbar, and the goods were brought out in the presence of an enormous body of police, both in uniform and in plain clothes. The goods were placed in a van; the van was taken to a convenient site, but the people were kept back a considerable distance from the van, and the goods were never brought out to view. The doors of the van at the back were just thrown open slightly, figures might be seen moving about in the van, and a piece of furniture was exhibited occasionally, but who bid for the goods, or who bought them, nobody knows to this day except the auctioneer and the police. The goods were just shown; and they were knocked down to some one, I presume, whether inside the van, or to police officers we cannot say; but the goods were knocked down and they were taken off. This sale aroused an enormous amount of feeling in Leicester and the neighbourhood; and the final result was that a public subscription was started to present Mr. King with goods to make up the loss he had suffered. A public meeting was called at the Temperance Hall, and some goods were purchased and presented at this meeting to Mr. King. I ought, perhaps, to explain that in many of these sales, persons' goods which have been seized have been recovered and have been handed back; but in this case of Mr. King the goods were sold absolutely; although they were goods upon



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which he, as most people do, seemed to set great store, they were entirely lost to him, being taken away we do not know where. However, goods to the same value in amount were presented to Mr. King at a public meeting, and resolutions were passed at the meeting condemning the law. I am exceedingly sorry that Mr. King, owing to the painful circumstances of his death which I have just named, is unable to come before you, because I am sure he would have placed this matter before you in a manner which would have shown you that under these distrains and sales a very considerable amount of mental distress is inflicted upon those who have the misfortune to be subjected to them.

13,675. (*Mr. Meadows White.*) What was King's position; was he in a position to pay the fine?—He was in a position to pay the fine.

13,676. (*Mr. Whitbread.*) You say the goods were exhibited in the van, sold to somebody who could not be identified, and were afterwards taken off; were they afterwards taken off by those parties, or taken off in the van?—They were sold in the van and taken away afterwards in the same van.

13,677. (*Chairman.*) That was done, I presume, on account of the apprehension excited by the crowd which had assembled on a previous occasion?—It was, but we had no means of tracing where the goods went to afterwards. Then before proceeding to the next head, I should like to observe with regard to these sales that in several instances, and especially in regard to Mr. Pratt, there were three other persons' goods sold at the same time. It has been the custom of the authorities to wait until there are a number of defaulters; and after their experience in the County Court on that occasion of Mr. Pratt's sale they proceeded much more cautiously, and waited generally until there were some 10 or 12 defaulters, so that the expenses attending the sale were considerably reduced; and ultimately I think they fixed a sum of 7s. 6d. as the amount of expense attending each sale.

13,678. (*Mr. Picton.*) At any time has any canvass been carefully taken to ascertain the opinion of the Leicester people upon the vaccination question?—Some years ago we did institute a canvass, I think it was in May or June, 1885.

13,679. Will you tell us how it was done?—It was carried out by the issue of forms, of which I have copies here, which were left at each house for a few days, and then called for after being filled up. The papers I am now handing round are the canvass papers which were used in May and June, 1885, for Aylestone Park, a district just outside Leicester. Similar forms were used for Leicester.

13,680. What kind of people were employed to take them round?—Working men who were opposed to the law.

13,681. But were they respectable people?—They were thoroughly respectable and reliable people. The papers were delivered, one to each house; and it states at the bottom of the paper, "This will be called for in a few days." We were anxious in 1885, in consequence of the large number of prosecutions which were then taking place, to know whether the people of Leicester were in favour of prosecution or not, because the Board of Guardians which had been returned in 1883 had ventured to carry out the law in the face of and contrary to promises which had been made by some of the Guardians; and it was felt desirable to ascertain the feeling of the people. The number of prosecutions rose so enormously that it was felt unnecessary to canvass the whole of the town; only one part of Leicester was canvassed, which embraced principally the ward known as St. Mary's Ward, and takes up nearly the whole of the west side of the town. I should think the population of that part would be about 33,000. The canvass of the whole of that ward was not completed, but of the papers delivered the results were 438 in favour of compulsion, 7,068 against compulsion, and 5,931 were against vaccination itself.

13,682. (*Mr. Whitbread.*) The 5,000 being included in the 7,000?—Yes. The 5,000 was included in the 7,000.

13,683. (*Mr. Meadows White.*) How many were for vaccination?—In favour of compulsion the number was 438.

13,684. But you have two questions on the paper. How many were in favour of vaccination?—1,173.

13,685. (*Mr. Whitbread.*) Can you tell the Commission how many papers were issued in order to get that result?—I could not give you the exact number that were issued; some were returned blank, but nearly all were collected. We did not continue the canvass, because we found that the prosecutions were increasing so enormously that that was a better proof even than the canvass of the opposition of the people to the law, and it was felt to be unnecessary trouble to carry the canvass any further.

13,686. (*Mr. Picton.*) What is the character of the population in St. Mary's ward?—The population is principally a working class population.

13,687. (*Mr. Whitbread.*) Did the distributors only leave one paper at each house?—Only one paper at each house.

13,688. (*Chairman.*) Were any precautions taken to see that the papers had been signed by the person who was the householder?—No steps were taken to see that; but I think in most, in fact in all instances, we were thoroughly satisfied that the householders themselves had signed the papers.

13,689. (*Mr. Whitbread.*) Was there any pressure put upon them by their surrounding friends?—Not the slightest pressure. Even apart from the canvass itself, as I before observed, the prosecutions rose so enormously that there was no need to take the canvass, but at the time we began the canvass there were not so many prosecutions being carried out; the opposition to the law grew much faster than our canvass proceeded.

13,690. (*Mr. Picton.*) Has it been found that the diminution in the practice of vaccination has raised the cost of life insurance in Leicester, and especially the insurance of children?—That is a question which has been very largely discussed in relation to Leicester. Some correspondence took place in reference to this subject some years ago. The question was brought to the front, practically, by a meeting of the Blue Ribbon Life Insurance Company which was held in a public room in Leicester.

13,691. (*Mr. Meadows White.*) Is that a mutual insurance company?—No, I believe not; it is an industrial insurance company.

13,692. Were the members of the insurance company the same persons who signed the paper against vaccination?—Decidedly not. This Blue Ribbon Insurance Company has in its policies this clause as rendering the policy void: "If the child shall die of small-pox, unless a certificate of successful vaccination by a duly qualified practitioner shall be produced." I have a letter addressed to me respecting this company saying that in consequence of that clause the mother of the children to which this policy (which I have before me) refers had taken her children out of the company, had withdrawn from it, in fact. Dr. Lankester presided at the meeting, and at the close of the meeting questions being invited, I put the question to the chairman and to Mr. Greening, who was the secretary and representative of the company there, as to whether they thought that a company with a clause like that in its policies would, under the circumstances that were then existing in Leicester, make any progress; and after some discussion upon the platform, the chairman announced that, so far as Leicester was concerned, the company would withdraw that clause. This seems rather a remarkable thing, because if that clause should operate anywhere it should certainly operate in the case of Leicester.

13,693. (*Chairman.*) I suppose competition for insurance business will lead companies to relax a good many restrictions, will it not?—That might be the case; but in regard to the Blue Ribbon Insurance Company, I was surprised only yesterday to learn that they still issue in Leicester policies with this clause in them. I obtained the policy I have here, which is dated the 22nd of September 1890, and the clause is in the policy, but it is ruled out; and I inquired of one of the shareholders in the company about it, and he told me that in every instance where an insurance was effected, if the request was made, they struck out the clause, but only on request.

13,694. (*Sir Edwin Galsworthy.*) Is that a local office?—It is an office with headquarters established in Birmingham.

13,695. Has it a large business?—I cannot answer for that. It first came to Leicester about 1885. The meeting at which this question arose was a kind of inaugural meeting.



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13,696. (*Chairman.*) Could you tell us the experience of the Prudential in that respect?—Yes; but before answering that question with respect to the Prudential, I might be allowed to explain that in view of my appearing before this Commission I thought it would be desirable to have this point cleared up, so I addressed the following series of questions to the various companies: “1. Does your company make any difference in its premiums and policies to the industrial classes of Leicester as compared with other towns on account of non-vaccination of the children? 2. In insuring children in an unvaccinated community, such as Leicester, do you run greater risks than in a vaccinated community? 3. Have you a clause making policies void in the case of death of a child from small-pox where no certificate of successful vaccination can be produced?”; and “4. In your general experience is the per-centage of mortality of children higher in Leicester than in other towns?” Those questions were addressed to the following companies, which are all companies doing an industrial insurance business in Leicester: The British Workman’s Insurance Company, the London, Liverpool and Legal, the London and Manchester, the Pearl, the Prudential, the Royal Liver, the Royal London, and the Star Benefit Society, and also to one called the Wesleyan and General Assurance Society. The answers to those questions were as follows: The British Workman’s Industrial stated, in answer to the first question as to whether they made any difference in the premiums, “None whatever”; and to the 2nd, 3rd, and 4th questions, “No.”

13,697. Does the writer state what comparative experience they had had, because your Health Officer’s report would rather seem to show from the statistics that the mortality of children in Leicester is higher than in other towns?—I am going now through the experience of the companies; I am well aware that our infantile death-rate is high compared with that of many towns; but I should be very glad if any questions upon that particular point were deferred until I deal with the statistical part of the subject.

13,698. But one would have, in order to ascertain the value of this statement, to find how much they insured in other places, and the comparative results?—I propose to deal with the figures, and in one instance only, I think, they will be found to be unfavourable with respect to the rate of mortality at Leicester. Proceeding with the replies, the same company state in their prospectus that “no one insuring with this office will be expected to pay for the privilege of being exempt from small-pox or vaccination.” I ought to explain that I do not know personally any of the secretaries of these companies.

13,698a. (*Chairman.*) There is rather an anti-vaccination ring about that particular sentence that you have just read, is there not?—The peculiar wording of it would convey to my mind the impression that the writer was opposed to vaccination.

13,699. (*Mr. Meadows White.*) It was written, perhaps, to be read to an anti-vaccinator?—Whatever it may convey to the mind of the Commission, I can only say that the questions were addressed to the companies in the ordinary way, coupled with an intimation that I intended to lay the answers before the Commission. The Royal Liver answer “No” to the three first questions, and to the question as to the mortality being higher in Leicester than in other towns, the answer is “Do not think so, but cannot state definitely.” The London and Manchester answer “No” to all the four questions; and then they go on to remark, “Out of 755 paying members on one book, probably two-thirds, during last 12 months, I have not had a single death of a child in Leicester.” The London, Liverpool and Legal state in reply to the first question, “None whatever”; in reply to the second, “We do not think we do”; in reply to the third, “No”; and in reply to the fourth they state that it is “lower” so far as their experience is concerned; and they accompany their letter with these observations: “The Leicester District of the Liverpool Victoria Legal Friendly Society has a lower death-rate than any other district of similar magnitude (in point of income) worked by the Society. We have a large infantile membership.” Then the Pearl Industrial state in reply to the first question, “No”; in reply to the second question, “We believe so,” that is to say, that they do run a greater risk; and in reply to the third question they say, “No”; and in reply to the fourth question, “Yes. Take Nottingham, for instance, a simi-

lar town for size and trade, the Registrar’s Returns “and our own run nearly three per cent. higher in Leicester for a given time.” I think that answer should be taken in connexion with the others. The Star Benefit reply “No” to all the four questions; and then they say this: “During the last quinquennium there has been no case of death from small-pox amongst our members who are located chiefly in the Midland Counties. The majority of deaths have been caused by fever, pneumonia, and other causes.” Then the answer of the Royal London Insurance Company is “No” to the first question; “Certainly not” to the second, as to whether they run greater risk; “No” to the third, and “No” to the fourth. Their reply is accompanied with these remarks: “I have in many cases where children have been vaccinated seen bad results arise from the same. I have lived in Leicester nearly all my life, and I am daily in contact with the working classes. Daily complaints have been made in the past, but now, I seldom hear of any, through not being vaccinated.” Then we have the Wesleyan and General Assurance Society, and they answer “No” to all the four questions. Now we come to the Prudential and I regarded, and do regard, the answers of the Prudential probably as more crucial than any of the others; and regarding them in that light, in addition to addressing the letter to the local secretary, I called at the office in London some month or two ago, and tried to see the manager. Unfortunately he was out, but he addressed to me a letter soon afterwards with the reply. I saw one of the officials there, whose name I forget at the present time, but I explained to him in course of conversation what information I wished to obtain; he treated the matter rather with contempt; he said that in their immense number of about 9,000,000 policies, they could not make any special regulation for Leicester, and that they regarded it as a mere drop in the ocean of their policies, but he added that they did not agree with us; they thought we were very unwise down at Leicester not to vaccinate, but that they could not pretend with an enormous business such as theirs to make any special regulation either in the way of remitting any particular clause or of enforcing it; but nevertheless I found that this company in the form they published for their medical referee’s report had this question: “Are the scars of vaccination visible?” I asked them to forward me one of the report forms they use at the present time, and I find that question has altogether disappeared. It does not affect Leicester alone; it affects their whole business.

13,700. (*Sir Edwin Galsworthy.*) I suppose that question appears in a very old paper?—No; it is not a very old paper.

13,701. What date is upon it?—There is no date upon it, but I do not think it is a very old one. At any rate I was given to understand that within the past few years they have decided to strike that out. The answers to the questions from the Prudential, as written by their own manager, are “No” to the first, and in reference to the second, as to whether they run a greater risk, he says, “This is a matter of opinion, and depends on the chance of a small-pox epidemic breaking out in Leicester.” To the third question he answers “No”; and to the fourth, as to whether the infantile rate of mortality is higher in Leicester, so far as his experience goes, he says, “Unable to state, as our mortality tables are not tabulated in districts.” The local agent, Mr. H. E. Farrow, also forwarded to me a letter with comparative tables, which probably will have no bearing upon the matter at this moment.

13,702. When you say those are the answers from the manager, do you mean from the London manager?—The London manager, Mr. Dewey.

13,703. And the answers from the other companies, were they from the local managers or from the chief offices?—My letters were all addressed to the local managers.

13,704. Were they Leicester men?—I do not think they were all Leicester men.

13,705. (*Professor Michael Foster.*) But one says he had lived in Leicester nearly all his life?—Yes, that was in the case of the Royal London.

13,706. (*Sir Edwin Galsworthy.*) You said that the Prudential people thought you were all very unwise, but you have no evidence that they charge a higher rate of premium than other companies?—No evidence at all. I simply referred to that as a private conversation with



one of their officials, not as any answer they gave to the questions.

13,707. They do not, I take it, nor does any company, charge higher rates for Leicester than for other parts of the kingdom?—They do not; but they have been urged to do so, and that is the reason why this question came so much to the front. I have a number of letters from medical men, where, in some of the journals published on behalf of the insurance companies, they have urged the companies themselves not to take the insurance of Leicester children at all, on the ground of their being unvaccinated; and although my reply may be a general one, it is specific in reference to Leicester itself, that if there is no such clause in regard to Leicester, then I take it that it proves that in the opinion of the insurance companies themselves they run no greater risk.

13,708. (*Sir William Savory.*) Does it prove that. Does it not rather show that they take it as a business question?—I take it that business questions would be regulated by the insurance companies according to the risk incurred. That would be the dominant factor.

13,709. But not the sole one?—Not the sole one; but in Leicester it should be the dominant factor.

13,710. (*Mr. Meadows White.*) At present the chances of a general epidemic would come in; you only see risk to Leicester when an epidemic arises, and therefore they may take it into consideration that when an epidemic arises then will be the danger?—But I understood the chances of epidemic were increasing every year in Leicester.

13,711. (*Mr. Picton.*) But I understand the Prudential Company have dropped all reference to vaccination?—The Prudential Company have dropped all reference to vaccination.

13,712. (*Professor Michael Foster.*) In their form of statement is there no reference to vaccination; is it struck out altogether?—Yes.

13,713. Is there no reference to vaccination in the form which the medical officer has to fill up?—No; in the old form there were three questions which I will read, and then the substitution for them in the new paper. The old form was: "Are there any external signs which indicate abscess, struma, or exfoliation of bone? Are the scars of vaccination visible? Is there any sign of the development of gout, as chalk stones or enlargement of joints?" Those questions are now concentrated into one. "Are there any external signs which indicate abscess, struma, or exfoliation of bone?" and the question as to vaccination is left out.

13,714. But in the whole list of questions is there no reference to any question as to whether the applicant has had small-pox or been vaccinated; is not there? "Have you spat blood, or have you been vaccinated?"—I do not see any such question.

13,715. (*Dr. Collins.*) Are there not two forms, one which the medical practitioner fills up, and one which the applicant himself fills up?—No doubt.

13,716. (*Professor Michael Foster.*) This is the medical referee's report, have you one which the applicant fills up himself?—I have not that. This question arose, as I observed before, out of some correspondence in the press, and I would be glad if you would permit me to read one or two of these extracts. A leading article appeared in the "Post Magazine and Insurance Monitor" on the 9th of October 1886, quoting some observations of Dr. G. Johnson, F.R.S. I do not know where he comes from. This is a quotation from an address of his which was given at King's College: "It is as certain as the sun will rise to-morrow that at no distant period small-pox will invade the town of Leicester, and as a result there will be such a massacre of the innocents—innocent victims of parental ignorance and prejudice—as will probably carry conviction to that eccentric member of the House of Commons who lately had the assurance to ask for an inquiry into the practice of vaccination." Similar letters have been addressed to this Journal. Here is another one under date 16th October 1886. The reason why I am quoting from these letters is that the conclusion the writers come to is to urge upon the insurance offices to have nothing to do with Leicester: "In the whole range of practical medicine there is no conclusion more firmly established than that efficient vaccination is an almost infallible preservative against small-pox. Any State that neglects to preserve the masses of the people from the ravages of this disease by ordaining compulsory vaccination, and by securing its

fulfilment, fails in one of its first duties. Intelligent citizens in their individual or corporate capacity should do their utmost to strengthen the hands of the Government in this respect." Then there is a reference to the insurance offices, and the writer, Dr. E. Symes Thompson, says: "It seems unlikely, however, that the offices will be called upon to legislate for a section of the community, small in numbers, and probably lacking in providence and those other cardinal virtues that lead men to the doors of the insurance offices." That is a reference to Leicester. There was an article in the "Insurance Post" of the 6th November 1886, bearing particularly upon the Prudential, from which I should like to read an extract, referring to the very long controversy which was taking place, and to the number of letters which had been written upon this subject, it states: "The subject has found its way into the pages of an insurance contemporary, in consequence probably of the endeavour made by some members of the faculty at Leicester to induce the industrial insurance companies to refuse their protection to unvaccinated children, and we are rather surprised to find that in one case at least there is a policy clause making the assurance void in the circumstance referred to. While any doubt exists as to the efficacy of the operation, and while there exists indisputable evidence of considerable danger attending it (making it a sort of balance of chances), the insurance office should not meddle one way or the other. This is the attitude of the Prudential, and we believe of most other offices; to refuse and drive away business on this account, in a town like Leicester, for example, would be very shortsighted, and any discrimination between towns is illogical and unpractical. As it happens, in Leicester, owing to good sanitary conditions and a good deal of character and sound sense in the working population, the death-rate is very low. The experience of the Prudential as regards claims in that town in the last three years has been in 1883, 30.19; in 1884, 33.33; and in 1885, 35.56 per cent. of the premiums, whereas their general ratio of claims, London and country, averages a fraction over 38 per cent." I think that raises a very important point. As our opinion has been challenged by correspondents, and as we profess to cultivate definite ideas with the courage to give them expression, we may say at once that we do not consider the case for complete protection to be made out with that thoroughness which would justify the Legislature in continuing the compulsory enactments. We have known serious and fatal mischief to follow vaccination, and believe the published cases would be more numerous if medical men were more candid. Inoculation with the virus of small-pox itself was at one time a kind of craze in this country, we are not quite sure that it was not compulsory; it would now be justly considered a crime." I think in that article we get the comparative rates of the Prudential, which after all is the most important company, so far as insurances are concerned, in Leicester.

13,717. (*Chairman.*) What is the next subject to which you wish to call the attention of the Commission?—The next division, under the head of "Prosecutions," is the testimony of parents before the magistrates as to injuries and deaths. Out of the large number of parents who have been summoned before the Leicester Bench, occasionally there would be a few who would make a defence and ask for the remission of fines or for dismissal; and under this head I have collected cases of parents before magistrates numbering 64, who testified to 24 cases of death, and to 32 cases of injury in their families or near relatives or persons of their own acquaintance.

13,718. What are those records taken from?—These records are taken from the published papers.

13,719. From the newspaper reports?—From newspaper reports of the cases. In some of these instances I have been present in the court myself and have taken the particulars.

13,720. (*Sir William Savory.*) Do you mean 24 cases of death in consequence of vaccination?—Yes, in consequence of vaccination.

13,721. Upon what evidence?—The belief of the parents.

13,722. Was there any further evidence than that?—I am not sure whether they produced any further evidence.

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13,723. Can you produce any further evidence?—I am unable to produce any. I cite this simply as showing the belief of the parents that such results can follow vaccination.

13,724. Do they satisfy your mind?—They satisfy my mind to this extent, that I believe the parents thoroughly and conscientiously believed that such results followed.

13,725. But do you believe that those 24 cases were deaths from vaccination, from the evidence you have there?—Yes, I do.

13,726. It convinces you?—Yes.

13,727. (*Mr. Meadows White.*) Have you compared those with the certificates of death?—I have seen none of the certificates of death in those cases.

13,728. The cause of death would be stated in the certificate?—Yes, a cause of death.

13,729. (*Professor Michael Foster.*) But you do not mean to say you have investigated each of these 24 cases?—I do not mean to say that I have investigated every one. I only cite those who come before the magistrates as alleged cases of death following vaccination.

13,730. You have stated that you believed they were really cases of death attributable to vaccination?—Yes.

13,731. You are convinced of it?—Yes.

13,732. You were convinced without any investigation?—I do not know that any further investigation is needed in reference to those cases.

13,733. (*Chairman.*) May it not often occur that an illness comes on after vaccination which is really an infantile complaint, which the parent may attribute to vaccination, but which in point of fact may be a disease which a child would have who is unvaccinated?—That is quite possible.

13,734. (*Mr. Meadows White.*) You have seen none of the certificates of death?—I have seen none of the certificates of death.

13,735. (*Chairman.*) I understand you to cite these cases as the belief of the parents who were prosecuted, and as the grounds upon which they objected rather than as actual facts?—Yes, I am dealing with the belief of a large number of parents in Leicester that such cases can occur, and saying that this is the ground of their objection to the law.

13,736. (*Professor Michael Foster.*) But you stated that you were satisfied as to this being the cause of death, and I want to know what satisfied you as to the cause of death?—I knew the parties in many of these cases; one was Mr. Cave, a man with whom I had frequent conversations, and I have also visited his family. I should like to read one or two of these statements to show what statements the parents have made before the magistrates. I have reason to believe and to know in many cases that those people are very intelligent people, that they are parents of children, and that they have had not only the experience of a child which has died or suffered this injury, but having other children have been able to compare with that result the health of children surviving who have not been vaccinated.

13,737. (*Chairman.*) In any of those cases were the reasons assigned accepted as reasonable excuses?—In none of the cases I propose now to quote. I propose, after I have dealt with this list, to produce a list of those in which the excuses have been accepted. In this list we have 24 cases of death alleged, I will put it in that way, and 32 cases of lifelong and other injuries.

13,738. (*Mr. Whitbread.*) Within what period?—Those would be since 1867, and the majority of them, I should say, since 1873 or 1874. Samuel Allen said, "He refused to have his child vaccinated in order to preserve its health. Five years ago he had a healthy child vaccinated. Seven days afterwards the child was examined by a doctor, who remarked that several children had been kept waiting to be vaccinated from it. The child received the usual attention, and within another week it was a mass of sores. As the result of vaccination showed itself, so the sores became apparent. The child's constitution was upset, and it was attended by a medical man for four years and eight months, when it died, as he believed, from the results of vaccination. This, he contended, was a reasonable excuse for his present refusal. He further stated that the child on whose account he was summoned was not in a fit condition to be vaccinated." I

have another case here, Mr. Allcroft, who pleaded that he "had reasonable excuse for refusing to comply with the Act. He was fully convinced that his first two children died from illness brought about by vaccination, and, therefore, wishing to preserve the health of his present child, he would not allow it to undergo the operation. The Mayor said that the Bench respected the defendant's position, but had their duty to perform. Defendant admitted that, but asked that under the circumstances a lenient fine might be inflicted; he thought the justice of the case would be thus met. The Mayor said the magistrates could not do less than fine him 10s. Defendant said that his wife had been ill for a fortnight, and he could not now pay the money. He was told to make arrangements with the Vaccination Officer." Those are samples of the cases. I do not wish to spend any length of time upon them, but there is a case here of a member of the Town Council, Mr. Bruce, who intends to come before the Commission and testify as to his child's death. I do not know any reason why any discredit should be placed upon this testimony; it is quite certain that in the large majority of these cases the belief in the parents' mind amounts to absolute certainty. I believe there have been a number of parents who have been summoned before the Leicester Bench who have really been negligent of their children's interest, and there is no doubt that when the law was framed it was framed to meet cases of that character; but where we have a number of men of fairly good position, as was the case with some of those whom I have in this list before me, who come before the Bench and make solemn statements, and are speaking from their own personal experience, I think they are worthy of our credence, and of the fullest acceptance. There is another case I should just like to allude to.

13,739. (*Professor Michael Foster.*) I did not mean to throw any doubt upon the statement of the parent, but to ask you whether you were quite convinced that the parent's view was actually the correct one?—I believe it was. I was about to ask permission to refer to the case of a man named Cave, an old schoolfellow of mine. I was not aware till some time ago that he disbelieved in vaccination, but observing that my name was somewhat prominent in the question, he stopped me one day and told me he fully agreed with our action in opposing the law, and he stated before the Bench in January 1877 that his youngest child had died within a fortnight of its vaccination; you could not, under any circumstances, find a more intelligent or thoughtful man; and when a parent, who has several children surviving and is able to observe the effect of these operations upon his children, makes a statement like that, I do not know any reason why we should disbelieve it.

13,740. (*Sir Edwin Galsworthy.*) Did he tell you the certified cause of death?—He did not; but I could obtain it for another week.

13,741. (*Mr. Meadows White.*) The purport of my question to you was that if you had the certificates, and those certificates showed vaccination to be the cause of death, that would corroborate those parents' views?—I cannot say what the certificates were.

13,742. (*Sir Edwin Galsworthy.*) Did you not ask him in that case, it being so soon after vaccination, what was the certified cause of death?—I did not; it was ordinary conversation which occurred as I met him in the street. I did not enter into any particulars.

13,743. (*Mr. Picton.*) Did he tell you any particulars?—He did tell me, but I cannot give the exact particulars of the case at the moment. I see him very seldom; he lives a long distance from me in the town. Then there is a case here of Mr. Bloxam, who "urged in objection that he already held one certificate of death of a child by vaccination. Alderman Stafford, presiding magistrate, replied that they could not consider that a reasonable excuse." I might say that I believe that almost the whole of these cases which I have here came before the Bench of magistrates before the year 1883, and I think the first dismissal by the Leicester magistrates was in the year 1883, although they had had these and similar defences made many and many a time. These are only a few which have been collected; they had not paid the slightest regard to them, and it was only in 1883, when I presume even the magistrates themselves were impressed somewhat by the magnitude of the opposition to the vaccination laws and the conscientious objections that were entertained by the parents, that they ventured to exercise their discretionary powers. I now come to that particular point, the dismissals by



the magistrates, and as there are very few of these I might perhaps just read them. Upon the 16th of February 1883, Arthur Johnson pleaded "that very ill effects had resulted from vaccination in other instances in his family," and he went on to cite those other instances, and the magistrates dismissed the case. That is the first case of dismissal under the Act in Leicester, the date being February 16th, 1883. Upon the same day a man named Thomas Green alleged that "he had two brothers both of whom had lost a child from the effects of vaccination. He had not himself been vaccinated and had not suffered on that account, and if his child required the operation he would want it himself." John Lewin made a defence of a similar nature. The magistrates adjourned both those cases for a fortnight that inquiries might be made into the truth of their statements. Those inquiries were made and the cases were finally dismissed. Then there is the case of a man named Charles Welch, who stated that a child of his had been ill ever since it had been vaccinated. This case was adjourned for 14 days. I mention these cases to show that although the magistrates did adjourn some of the cases they had not come to the conclusion that they could accept unreservedly the statements that were made before them. The adjournment was for 14 days in order to obtain a medical certificate showing the cause of the other child's disease. Those were the first cases of dismissal before the magistrates in Leicester. Then on April 9th a man named John Clifford alleged "that one of his children had died through vaccination, and that two others were suffering from the effects of the operation; and that the one for whom he was summoned was healthy. Mr. Alderman Stafford, the presiding magistrate, said defendant had shown sufficient reason why he should not be fined, and they therefore dismissed his case." On April 16th, 1883, there were several other dismissals, Walter Clarke, Joseph Henry Stanley, Frederick Smith, and John Helps. The evidence in the cases of Clarke and Smith was that they had had children who had suffered considerably from the effects of vaccination. The other two had each had a child who had died from it. On April 20th, 1883, a large number of parents were summoned for neglecting to have their children vaccinated, in many of which cases fines were imposed by the magistrates and five cases were dismissed. I cite that to show that although the magistrates had then apparently arrived at the conclusion that many of these objections to the law were valid, they did not indiscriminately dismiss the whole of the cases, because on that occasion they imposed fines in about 10 instances. Then there was a case on the 15th of October 1883. The wife of Thomas Stevenson appeared and said that her second child died in convulsions within five weeks, as the result she believed of the operation. This case is one of those I referred to in the previous sub-division of parents before magistrates. That case was also dismissed. Then on February 27th, 1885, there was a man named George Neat summoned, whose wife attended on his behalf and stated that "one of her children had been blind for six weeks from the effects of vaccination, and that another child, two and a half years old, had died from being vaccinated, its arm being black to the finger tips. Alderman Stafford said if that was the case she would be excused and the summons dismissed."

13,744. (*Mr. Picton.*) Was inquiry made in that case, do you know, to ascertain the facts?—I am not quite sure about that particular case; but in a number of those cases they were certainly postponed for inquiries to be made by the magistrates. Then on the same date the wife of Frederick Shaw said that "a child of hers had died from the effects of vaccination when only nine months old, with its arm perfectly black. The magistrates, however, ordered her to have the child vaccinated and to pay the costs." I presume they had not sufficient grounds for believing her statement. I mention it again to show that the magistrates really paid a considerable amount of attention to the statements which were made to them, and that they did not indiscriminately dismiss those cases. In all there have been 17 cases of dismissal by the magistrates.

13,745. (*Chairman.*) Does that cover all you have to say with regard to prosecution and the action of the Guardians?—It does.

13,746. (*Sir William Savory.*) Do you know whether the magistrates in any single case asked for the certificate of death where the death was alleged to have occurred from vaccination?—Yes, I believe they frequently asked for it.

13,747. And it was produced?—I am not sure whether it was produced on any occasion, but in each of the instances I have cited satisfactory circumstances were found to account for the allegations of the parents.

13,748. Do you know of any case in which a certificate of death from a qualified medical man supported the allegation?—I could not refer you to one at the present moment.

13,749. (*Dr. Collins.*) I understood you to cite one case in which the certificate was produced in court?—It was produced in court. I referred to it under the previous sub-division.

13,750. And pleaded as an excuse?—Yes.

13,751. But the man was fined none the less?—Yes, the man was fined nevertheless.

13,752. When was that?—This particular case was in October 1882; the first dismissal took place in 1883; the production of the certificate might have had some effect upon the magistrates' minds, because very soon afterwards they did begin to dismiss some cases.

13,753. (*Sir William Savory.*) Can you tell us of your own knowledge that the certificate stated that the death was due to vaccination?—Yes, one death.

13,754. (*Dr. Collins.*) Are you aware that the Registrar-General's returns give some 40 or 50 deaths every year as being from vaccination and its effects?—Yes, I am aware of it; and I am aware of the existence of some certificates of death in Leicester which certify vaccination as the cause, but not in those particular instances.

13,755. (*Sir William Savory.*) Could you give me the exact number of cases in which death has been certified to be due to vaccination in Leicester within any given time?—I could not; but they are very few, because the total number certified by the Registrar-General is only 40 or 50 per annum for the whole kingdom, but I will try to ascertain.

13,756. (*Dr. Collins.*) I suppose Leicester would provide less opportunity than most other towns for such certificates?—It would for many years past.

Adjourned till Wednesday next at 1 o'clock.

Mr.  
J. T. Biggs.  
18 Feb. 1891.



## Fifty-seventh Day.

Wednesday, 25th February 1891.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

M.  
J. T. Biggs.  
25 Feb. 1891.

13,757. (*Chairman*.) What is the next point to which you wish to direct the attention of the Commission?—I would like, with your Lordship's permission, to refer to one or two matters which occurred at the last meeting.

13,758. Do you mean by way of correction or addition?—In addition. There was a question raised with regard to the insurance of children, and since I was here last week I have obtained the proposal forms which are used now for infantile insurance. I have got one filled up, and I have also a recent policy of the Prudential, which will, I think, fully prove the points which I brought before the Commission.

13,759. What is it that you wish to call attention to in these forms?—The forms which I laid before the Commission last week were the medical referee's report, and it was stated that they were forms for adult insurance. I now produce a form of proposal for the insurance of a child.

13,760. (*Mr. Meadows White*.) Have you a form of adult proposal which corresponds with the medical referee's report which you produced last time?—I have not.

13,761. You will remember that the question was struck out as to the scars of vaccinations, and it was pointed out to you that that was a question put to the medical referee, and there was a question put to you, I think, as to whether there was not some question relating to vaccination in the form issued to the proposer himself?—I thought the principal objection made to the evidence I gave last week was that the form I produced referred to adult rather than to infantile insurance; I thought so because it appears to me that the matter would really refer rather to infantile than to adult insurance.

13,762. (*Chairman*.) There is no limit of age, is there, below which they do not insure?—I do not think there is. I obtained a policy and also that form fully filled up so that you might see the course pursued.

13,763. (*Professor Michael Foster*.) Parents insure the children immediately after birth, do they not?—I cannot answer that question; but I suppose within a few days of the birth they frequently insure.

13,764. But before the time at which vaccination is usually performed?—Yes, there is no doubt of that. There is one other question arising in reference to the letters I produced from the secretaries to the companies; I should like to reiterate that I have no personal knowledge of any of the gentlemen to whom I addressed the letters, but since I was here last week I have made some inquiry with regard to a suggestion which was made last week that the letters were intended to be read to an anti-vaccination meeting, or something of that kind. I have made inquiries, and I find that only two of the secretaries are Leicester men; the others are all strangers to the town. They certainly are not known to me personally, and I do not know that I am known to them; they possibly may know of me; but from the terms in which my letters were couched they could have no knowledge of my feeling in the matter, whether I was for or against vaccination.

13,765. (*Chairman*.) Is that all you wish to add to the subjects discussed at the last meeting of the Commission?—Yes, in reference to that particular one. Then I produced last week a list of 17 cases which had been dismissed by the magistrates upon the allegation on the parent's part of deaths and injuries arising from vaccination; and I came to the conclusion in laying this evidence before the Commission that as the magistrates were satisfied as to the truth of the statements of the parents there would in those particular cases be no special reason why any further investigation should be made. Then I produced a further list of about 60 parents making similar allegations before the magistrates whose cases were not dismissed. In this number there are 24 deaths testified to by those persons, and 32 injuries. I am afraid I did not make it clear enough to the Commission that the whole of those cases had been investigated. From reading the report of my examination last week it struck me that I might have left it rather too indefinite.

13,766. How do you mean "investigated"?—I mean investigated by some person. I do not mean that any medical investigation took place at all; but since I was here I have looked through the list and I can say that I know a number of those persons myself personally, and I am convinced as to the veracity of the statements they made. There are two or three of them who will appear before you as witnesses, and the Commission will then be able to judge as to what I said; but taking all those 24 cases (I have singled them out from a number of other cases), either I had seen them before their appearance before the magistrates, or someone who might be regarded as occupying an equally responsible position to the one which I occupied at that time, someone connected with the League which was opposed to vaccination, had made some investigation; and I considered that those 24 stood on a basis which probably the others which I mean to present this afternoon do not stand upon; in this sense, that the statements were made in a public court of justice, and in addition to these statements being made in a public court of justice where investigations could take place, other investigations upon the part of private individuals occupying responsible positions have been made.

13,767. (*Sir William Savory*.) Did you ascertain what the certificate of death was in those 24 cases in addition to making an investigation?—I have obtained copies of the certificates in some of those cases. I had proposed when I left last week to obtain the certificates in every case.

13,768. Would that not have been the best plan to obtain certificates of the cause of death in every case?—Yes, possibly that might have been the best; but if I understand this matter rightly, it does not depend altogether either upon death certificates or upon medical evidence, because in a matter of this kind affecting the operation of the law you must necessarily receive a considerable amount of evidence apart from what you might call skilled evidence; and I know no reason whatever why evidence of that character should not be entitled to just as much respect as skilled evidence itself.



13,769. You would draw no distinction, would you, between skilled and unskilled evidence as to the cause of death?—I would draw a distinction.

13,770. In what direction would you give the weight?—I would say that where the cause of death was palpable upon a certificate given by a medical man who assigned vaccination as the cause of death there would not be the slightest question about it.

13,771. (*Chairman.*) You mean that that would be a stronger case than the view of the parent that the one thing had followed the other?—Yes.

13,772. (*Sir William Savory.*) You spoke of veracity just now; do not you think some special knowledge is required in many cases to determine the cause of death?—I have no doubt that special knowledge is required in many cases.

13,773. Do you think the parents would be competent to assign the cause of death apart from medical assistance?—I do not know that the parents would be competent to assign the cause which would be assigned by professional men, but I do know this; that as parents, experiencing the results which followed any particular operation, and watching night by night and day by day the health of their children, they are fully competent to judge as to whether a given cause produced a certain effect.

13,774. (*Chairman.*) But I suppose you will admit that as regards certain complaints which are known to affect children commonly, whether vaccinated or unvaccinated, although they may show themselves after vaccination, it would not necessarily follow that they resulted from the vaccination?—Not necessarily so.

13,775. You would have to consider the circumstances of each case?—No doubt.

13,776. (*Dr. Collins.*) Can you tell the Commission from any investigation you have made, or from any information which has come before you, whether in the case of death from erysipelas after vaccination it is or is not the practice to put vaccination upon the certificate of death?—Not always.

13,777. Have you any particular case in your mind to which you could direct the attention of the Commission?—I have a certificate of death here. This is a certificate of the death of a child named Grace Cave; Mr. Cave was an old school-fellow of mine; he was the one I referred to last week, and it struck me on reading my evidence that possibly the impression might be produced upon the minds of the Commission that from just a sort of haphazard conversation which we may have had in the street with regard to the child that was sufficient evidence to my mind in regard to the child's death. I ought to have explained that upon many subsequent occasions I have seen Mr. Cave and he has described the facts to me; but that was years ago, and last week I could not recall the facts. This child was four months old at the time it died; it died within 16 or 17 days of the vaccination, and the certified cause of death is "diarrhoea: marasmus." Now Mr. Cave assures me that there was not the slightest indication of diarrhoea, either purging or sickness, and he told Dr. Sloane, who was the medical attendant and who is the medical attendant of his family, and who was the man who performed the operation, that this certificate of death was altogether wrong, and that he knew the cause of death was vaccination.

13,778. (*Chairman.*) What was the date?—The 7th August 1872.

13,779. (*Dr. Collins.*) I do not think you quite answered my question, which was whether you could tell us from any investigation you might have made, or from any means of information which you possess, that in any case in which it had been shown by inquiry that death from erysipelas had resulted following vaccination, "vaccination" had not appeared upon the certificate of death?—I can refer you to a case of that kind.

13,780. (*Mr. Meadows White.*) Who is Dr. Sloane; do you know him?—Yes, I know him, but not intimately; he is a man who has been in practice for many years in Leicester; he occupies a very good position.

13,781. And he did attend the child?—Yes, he did attend the child; he is a man in very large practice, and, I believe, a fairly popular man amongst the class he attends.

13,782. And that certificate is undoubtedly signed by him; it was not an assistant who certified?—At this time the name of the medical man was not entered upon

the certificate, but I have every reason to believe that he signed the certificate himself.

13,783. (*Sir William Savory.*) There is no name given?—Not the name of a medical man.

13,784. What did the father allege to you to be the cause of death?—Vaccination.

13,785. But in what way; how did it kill?—Shall I read Mr. Cave's letter, which would explain it better, I think.

13,786. (*Chairman.*) Do you say Mr. Cave is going to be called as a witness?—No; he is unfortunately suffering from a physical disability and he could not come, although I wrote to him to come. This is the letter, "20, Hazel Street, Leicester, February 23, 1891. My dear Sir.—In reply to your inquiry respecting my child "which I told the magistrates I lost through vaccination, "I send you the following particulars. My daughter, "Grace Cave, was born on the 23rd day of March 1872, "a fine healthy child; she was my third child; my two "older children had been vaccinated in their early "infancy, but the operation on the second child, a son, "from which he suffered a great inflammation and "swelling in the arm and shoulder, soon followed by "an abscess in the neck, causing great pain and suffer- "ring, and leaving an indelible scar in the neck, led "me to seriously inquire into the nature of vaccination, "with the result that I began to doubt its efficacy, and "became anxious to avoid the operation in the case of "my third child (the one referred to before the magis- "trates). On receiving the official notices from the "Vaccination Officer I expressed my doubt and anxiety "to our doctor on this subject, who assured me that the "greatest care was exercised in the selection of lymph. "However, I still refused to submit the child to the opera- "tion, until at length not being able to pay fines or have "my home sold up, I was compelled to suffer the child "to undergo the operation, but with the greatest reluc- "tance, and for which I paid the charge of 2s. 6d. She was "never well again, but sank under it day by day from "shock to the system. She seemed to us to have internal "erysipelas, so far as we could see her throat was quite "raw, and she could not swallow, and on the gentlest "movement would scream as though suffering acute "internal pain. We called in our doctor, but he was "unable to relieve her; we directed attention to her "throat and internal condition, giving it as our opinion "that it was the result of vaccination. He did not "admit this, but suggested that the child might have "been ill if it had not been vaccinated, though it might "have been as well if it had not been done, and assured "us of the great care exercised in the selection of "lymph, which I could readily believe, for I had every "confidence in his professional ability and skill. The "child lingered on some days longer, when she died on "the 7th day of August, the operation being performed "on the 21st day of July, giving 16 clear days exclusive "of the day of operation and the day on which she "died. You may judge that we deeply regretted the "result, and we resolved that no amount of persecution "or fine or imprisonment should ever induce us to "submit another child of mine to vaccination, and "hence my appearance before the magistrates, when "at length I had another child born. I made the "best defence I could, and urged as a reason for my "opposition and resistance to the law that I had lost "my last child from the ill effects of vaccination in a "fortnight after the operation had been performed. "They were deaf to all appeals, and the usual fine was "inflicted. I enclose copy of certificate, which states "diarrhoea: marasmus' as the cause of death, but I am "quite certain in my own mind that her death was the "result of vaccination. I am, yours truly, Benjamin "Cave. To Mr. J. T. Biggs."

13,787. (*Professor Michael Foster.*) He does not say in that letter that there was no diarrhoea?—He does not say so, but he told me so personally.

13,788. (*Dr. Bristowe.*) Diarrhoea was a very fatal disease in Leicester, was it not?—It was about that time.

13,789. About that time of the year?—Yes; it is a sort of recurring summer epidemic.

13,790. (*Dr. Collins.*) I have before me the report of an inquiry into certain deaths and injuries alleged to have been caused by vaccination at Norwich in 1882, and on page five I find the case of Maud Colison, in which it was said: "The child was vaccinated upon the 13th "of June, and was taken ill on the 21st of June, the day "after inspection. It was attended once only by Dr.

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"Guy, who, although he gave a certificate of death from bronchitis, admitted, after hearing the evidence, that the child must at the same time have been suffering from erysipelas." In that certificate of death I do not find any reference to vaccination. I was wondering whether any facts of that kind had come under your knowledge?—One has recently occurred in the case of a child named Constance May Wood, this was a case which occurred at New Humberstone just outside Leicester, and such were the reports about it, that Dr. Ballard was sent down by the Local Government Board to investigate this case, and this is his report. (*See Appendix IV., page 489.*) He came down to investigate the matter, and I see here that he blames the medical man for not naming "vaccination" in the certificate of death. He says, "The child died on November 19th. I append the certificate of cause of death given by Mr. N—. It states that he had seen the child last on November the 15th, and that the cause of death was diffuse cellulitis. I told him he should have mentioned the previous vaccination in his certificate." This was the case of a child which had been selected by this medical man who was the Public Vaccinator for the district as the vacciner for the district. I saw the child before it died.

13,791. (*Chairman.*) How long was the vaccination before the death?—I think about six or seven weeks.

13,792. (*Dr. Bristowe.*) And how long after the vaccination did the cellulitis commence?—There is a published report upon this case.

13,793. (*Sir William Savory.*) Does Dr. Ballard express the opinion that vaccination was the cause of the cellulitis?—I am not sure of that.

13,794. That is a very different thing from blaming the medical man for not stating that vaccination had been performed?—This is a very important report, because in the first place the lymph was purchased from an association which is established for the supply of pure vaccine lymph.

13,795. (*Mr. Whitbread.*) What was that association?—Dr. N—'s account to Dr. Ballard was this: that "On September 18, with a view to establish a stock of fresh lymph for his October vaccinations, he vaccinated at their homes in Old Humberstone village four infants, with lymph purchased from Messrs. John Richardson and Co., of Leicester, who are agents for 'The Association for the Supply of Pure Vaccine Lymph,' the office of which is at 12, Pall Mall East, London. He states that he purchased the lymph in two tubes, one-third full, immediately before using it; so he had not kept it by him for any time." Dr. Ballard then says, "I enclose, for the Board's inspection two similar tubes subsequently purchased, which Mr. N— permitted me to impound, and also Mr. N—'s vaccination register, in which are entered the names of all children vaccinated, and the results of the operation." I notice in this report, which will probably be furnished to the Commission, that all through the operator is blamed by Dr. Ballard for omitting to follow the instructions of the Local Government Board, which are very full; I mean the instructions to Public Vaccinators, which are very complete. I do not think they are often followed out, and I do not see how in public vaccination stations it is possible to follow out those instructions in the minute detail in which they are laid down. Dr. Ballard speaks of the operator as breaking instructions 6, 7, and 8. He also says this: "As to the surroundings of the infant: These, as I have shown above in detail, were such that no surgeon in his senses would willingly or except under urgent compulsion have performed in this place any serious operation productive of a wound, nor would any experienced surgeon have been surprised that an accidental wound or sore became attacked by erysipelas." Dr. Ballard made an inspection of the premises, and he came to the conclusion that this was a very insanitary neighbourhood. All I can say with regard to that is, that the neighbourhood was equally sanitary with its surroundings, and that similar occurrences had not taken place in other parts of New Humberstone.

13,796. (*Chairman.*) Erysipelas has been a complaint very prevalent in Leicester, has it not?—I do not know but it has been particularly so.

13,797. I am only speaking from the report drawn up by the Medical Officer of Health?—Erysipelas is one of the diseases notified under the Diseases Notification Act. There are a very large number of cases of erysipelas for which notification is received, and I know, as a fact, they

are not entertained by the sanitary committee. They decline to pay the fees. It is a matter of common report to the committee with which I sit every week, and in our quarterly reports too a certain number are always given as notifications which have not been entertained; probably that would indicate to your Lordship that a very large number of cases of erysipelas are notified and possibly create an impression which would be altogether out of character with the actual number which occur.

13,798. Are they notified by the medical men or only by the parents?—They are notified by the medical men.

13,799. (*Sir James Paget.*) Are they notified as cases of erysipelas?—Yes.

13,800. Do you doubt that they were cases of erysipelas?—I see no reason to doubt it except this, that we have a Medical Officer of Health who has to judge of these cases; when a case is notified he visits it, and it is for him to put a check upon any undue amount of notification; and I know as a fact that he does strike out a number of these cases every quarter, showing that in his opinion they are not cases of erysipelas.

13,801. (*Mr. Whitbread.*) What do you suggest is the reason of the undue notification?—I have no suggestion to make; I can only repeat that that is the action of the sanitary committee upon the report of our Medical Officer of Health.

13,802. (*Professor Michael Foster.*) Those are notifications by whom?—By medical men.

13,803. (*Sir William Savory.*) The Medical Officer sees the children or persons notified?—Yes.

13,804. Are you sure he sees them before he strikes them out of the notification?—I cannot be sure that he does. I only know that he occupies the position, and that he is expected to perform that duty, and I see no reason why he should not perform it faithfully.

13,805. (*Chairman.*) Is there a fee paid on notification?—Yes.

13,806. Of how much?—Two and sixpence, and that has been suggested before the committee as a motive for so many cases being notified.

13,807. (*Professor Michael Foster.*) You stated that the suggestions of the Local Government Board were not carried out by Public Vaccinators?—I do not think they are.

13,808. Do you express that belief from your knowledge of the actual course taken by the Public Vaccinators or on general grounds?—On both. At the time when vaccination was in full swing in Leicester there would be probably 30 or 40 infants vaccinated one morning, and it would be impossible during the time the operator has to carry out those operations for him to carry out the examinations which are prescribed by the Local Government Board.

13,809. How many public vaccinations have you watched in their conduct and so supplied yourself with actual knowledge?—I have attended at the public vaccination station in connexion with the Poor Law offices, and I have known week by week the number of vaccinations which have been performed; I know the time that is taken by the operations, and I know it is a physical impossibility to observe all the regulations within that time.

13,810. (*Sir James Paget.*) What would be the time taken upon, say, 40 cases?—I do not know what time would be taken in operating upon 40 cases, but the Public Vaccinator is expected to be one hour at the station, and in one hour I think it would be utterly impossible for any medical man to carry out the instructions of the Local Government Board with regard to 40 children.

13,811. (*Dr. Bristowe.*) Have you any reason to suppose that he does not remain longer than one hour when so many cases present themselves?—Yes, I think he possibly might, and in some cases he has done.

13,812. (*Professor Michael Foster.*) On how many occasions have you watched the Public Vaccinator and seen that he does not carry out the instructions of the Local Government Board?—Five or six times I should think. I have also commissioned someone to watch the operations and see how they are carried out.

13,813. (*Sir James Paget.*) In what respect did he fail to carry out the directions of the Board?—The "Instructions for Vaccinators under Contract," dated



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29th July 1871, are, "Except so far as any immediate danger of small-pox may require, vaccinate only subjects who are in good health. As regards infants, ascertain that there is not any febrile state, nor any irritation of the bowels, nor any unhealthy state of skin; especially no chafing or eczema behind the ears, or in the groin, or elsewhere in folds of skin. Do not, except of necessity, vaccinate in cases where there has been recent exposure to the infection of measles or scarlatina, nor where erysipelas is prevailing in or about the place of residence. In all ordinary cases of primary vaccination if you vaccinate by separate punctures, make such punctures as will produce at least four separate good-sized vesicles, not less than half an inch from one another or if you vaccinate otherwise than by separate punctures take care to produce local effects equal to those just mentioned," and so forth. The first regulation which I have read to my mind involves a very careful examination of the infant, and I do not see how that examination can be made (and as a matter of fact I know it is not made) in the time at the disposal of the Public Vaccinator. To do so he would have practically to strip the child, and under any circumstances he would have to carry out some considerable investigation which the time does not permit.

13,814. (*Professor Michael Foster.*) And you have seen the Public Vaccinator vaccinate infants without making any such examination?—I have seen the parents enter the small room where the operations are being performed and come out in the course of a few minutes.

13,815. But have you watched the Public Vaccinator himself?—Not in the small room; I cannot.

13,816. You do not know what he did?—Not inside the room, but I know what the parents have told me when they came out. I do not see why we should disregard the testimony of the parents upon that point.

13,817. (*Chairman.*) I see in the report on the Health of Leicester for 1888, which may be what you have referred to, that under the heading "Erysipelas" the Medical Officer says: "The remarks made in former Health reports respecting the notification of this disease are still applicable. Although 255 cases have been notified, the majority of them have been of a slight character, and certainly of no significance from a sanitary point of view." Would that represent what the Medical Officer has represented to you?—Yes, that is a simple description of what occurs which he reports to the sanitary committee week by week.

13,818. (*Dr. Bristowe.*) That does not imply, does it, that the medical officers were not paid for their notifications?—I do not know that any statement is made in the book respecting it, and I am afraid I have not a copy of the quarterly report of the council meeting, which generally states the number of notifications which have been struck out. I could produce those by the next meeting if it were desired.

13,819. I have the impression that you would be behaving illegally in refusing a notification?—The Medical Officer has reported upon these cases, and he has stated over and over again that the merest scratch is reported.

13,820. (*Chairman.*) I am not quite sure that I fully understand the Medical Officer's reasons. He says: "The deaths registered as due to Erysipelas were 8 only in number, as against 10 in the preceding year, a sufficient proof that the bulk of the cases reported (255 in number) were of the mildest character." Now I find that out of 132 cases of scarlet fever there were only four deaths, that would not show that they were not all cases of scarlet fever, and real cases of scarlet fever?—Not at all. Those two figures would show about the same death-rate.

13,821. (*Mr. Meadows White.*) Under the Diseases Notification Act if a medical practitioner does not send in a notification of certain diseases, of which erysipelas is one, he is liable upon summary conviction to a fine?—Yes.

13,822. (*Chairman.*) He is liable to a penalty of 10*l.*, is he not?—Under our local Act that is so. I think the penalty is higher under that than under the general Act.

13,823. (*Mr. Meadows White.*) Are you speaking of notifications under the recent Act?—Not under the recent Act, but under our local Act, which I believe is a little more stringent than the Act which has just been passed.

13,824. (*Sir William Savory.*) Going back for a moment to a previous branch of your evidence; you say you have medical certificates of the cause of death in some of the 24 cases?—In some of them. It was my intention to obtain them all.

13,825. In how many have you the certificate of the cause of death out of the 24?—Four.

13,826. And what do those four say?—I will read them. This is a certificate of death of Annie Allcroft, it was given on the 1st of August 1874. "Certified cause of death, infantile diarrhoea."

13,827. That is not certified to be due to vaccination?—It is not.

13,828. Now what is the next?—The next is Charlotte Elizabeth Allcroft, that is certified as "Diarrhoea and convulsions," the certifying medical man is Dr. Blunt, who is now deceased.

13,829. Is that certified to be due to vaccination?—No. Then I have another, George Eaton Bloxam, the certificate by Dr. Craggs is "Erysipelas, probably resulting from vaccination." The fourth is the one I have already mentioned; Mr. Cave's child.

13,830. That is not certified to be due to vaccination?—No, it is not.

13,831. Have you any evidence of the cause of death in the other twenty cases?—I have not been able to obtain the certificates of those owing to various causes, personal illness being one. I know nothing of the certified cause of death in those cases, and I repeat again that I did not think it necessary to obtain a certificate of the cause of death to settle the question whether the death arose from vaccination or not.

13,832. (*Mr. Picton.*) Is it the feeling of you and those who think with you that the strong desire to protect the practice of vaccination leads sometimes to the concealment of the real cause of death?—I think there is no doubt about it.

13,833. You think it is not sufficient to get the technical cause of death as certified?—I do not believe it is necessary at all.

13,834. You believe that under the technical cause of death the influence of vaccination is often concealed?—Yes.

13,835. You and your colleagues in Leicester have got information from various parts of the country, I presume, of the action of similar influences to those indicated in the words of Mr. Henry May, of Birmingham, reported in the Birmingham "Medical Review" of May 1874, in which he says: "A death from vaccination occurred not long ago in my practice. Although I had not vaccinated the child, yet in my desire to preserve vaccination from reproach I omitted all mention of it in the certificate of death." Has that come under your knowledge?—Yes, I was just about to quote that. I have the Birmingham "Medical Review" here.

13,836. Has your view been influenced by other statements of that sort?—Yes.

13,837. (*Sir William Savory.*) Can you tell the Commission how many confessions of that sort you have had brought before you which have influenced your opinion?—There is this particular one of Dr. May, and again I have an extract from a speech of Dr. Pearce at the Marylebone Vestry Hall.

13,838. Who is Dr. Pearce?—He is a London doctor.

13,839. (*Professor Michael Foster.*) He gave evidence before the Committee of 1871, did he not?—I think he did. He says, speaking on October the 19th, 1870: "This frightful mortality of infants is the direct consequence of vaccination; a natural result; indeed Jenner tells us that that vaccination is alone protective which is attended by erysipelas, while the spontaneous cow-pox which is unattended by erysipelas is not protective. Yet when children die of erysipelas following vaccination the deaths are certified 'deaths from erysipelas,' while the truth is concealed. The death should be certified properly death from vaccination. But when an inquest is held in this parish under the coronership of Dr. Lankester on a child of Mr. Emery, of Great Portland Street, although the evidence adduced to the jury clearly showed that the child died in consequence of vaccination, efforts are made to conceal the facts; for while the jury unanimously returned a verdict 'died from erysipelas caused by vaccination,' the coroner's copy deposited



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" at the Registrar-General's Office, Somerset House.  
" certifies the additional words ' death by misadventure.'  
" And with what object were those words added  
" but to screen the operator." [Vaccination Tracts.  
William Young, 1877.]

13,840. (*Sir William Savory.*) That does not quite answer the question I put to you whether within your knowledge you had come across similar cases to that which Mr. Picton just presented to you. It is a very serious charge to make; you have evidence in support of it I suppose?—I am making no charge at all. I am citing the opinions of medical men themselves.

13,841. I am asking for any facts within your knowledge in Leicester where there has been deliberate concealment of vaccination as the cause of death?—I think there was in that instance of Mr. Cave's, which I have cited. But there is another case which I heard of just recently. It is the case of a parent who is coming before the Commission to give evidence. I suppose I might allude to it now, it is the case of a child of Mr. Payne's, at all events he is one of the witnesses who is coming. The medical assistant told him he dared not mention vaccination upon the certificate; but I had very much rather, although I have heard of it, that you had the evidence from the witness himself.

13,842. You hardly present that as evidence?—I do not present that as evidence; I am giving that as an answer to the question that was put.

13,843. Can you give the Commission any more evidence in support of that charge?—I have already submitted a list of 24 cases of death which the parents allege were due to vaccination. I feel convinced that if I were to obtain the certificates in the whole of those cases in all probability they would throw no more light upon the subject than those I have instanced.

13,844. From that you assume that in those 24 cases there was a deliberate attempt made on the part of the medical men to conceal the cause of death?—I have made no charge against the medical profession, nor do I wish to do so.

13,845. Then what is the object of presenting this? I ask you what evidence can you give of the fact, I will not call it a charge, that the medical men wilfully concealed vaccination as being the cause of death when they knew it to have been the cause of death?—The question put to me by Mr. Picton was, did I know that that belief prevails in Leicester, and I say again that it does prevail.

13,846. But you told the Commission that you believed it. What facts are you acquainted with to show that any medical man has refrained from certifying vaccination to be the cause of death when he believed it himself to be the cause of death?—That is an extremely difficult question to answer.

13,847. Can you produce any evidence to show that?—I do not see how it is possible for any witness to produce any evidence to show the working of a medical man's mind.

13,848. (*Dr. Collins.*) You would require evidence of the belief of the medical man?—Unquestionably; all I can say is, I have never made any attempt, and I do not think I can be charged with having intended, to throw the slightest imputation upon the medical profession.

13,849. (*Sir William Savory.*) Then we may take it that when a medical man does not certify vaccination to have been the cause of death, he does not believe it to have been the cause of death?—In all probability.

13,850. (*Mr. Meadows White.*) You think the parent's statement ought to outweigh the statement of the medical man, or the inference to be drawn from the certificate being silent upon the point?—For my part, from the experience I have had of the statements of the parents, and from their experience of the children, I would prefer, upon the question of whether death had resulted from vaccination, to take the parents' statement before the statement of the medical man; not, however, casting any reflection upon the statement of the medical man, but simply from the experience of the parents, as I stated before.

13,851. (*Sir James Paget.*) You referred to deaths from diarrhoea, which you believed were due to vaccination?—I stated that the vaccination was an exciting cause.

13,852. But with a disease so frequent as diarrhoea is in Leicester, might it not have been that the diarrhoea followed vaccination, but was not produced by it?—That might possibly occur where the child recovered from vaccination before the diarrhoea commenced, but in most

of these instances the diarrhoea follows on before the child has recovered from vaccination.

13,853. But might it not follow upon an accidental wound of any part?—Yes, it might.

13,854. The mere fact of its following vaccination is not a proof that it was a consequence of vaccination?—Not necessarily. I do not wish to anticipate what I have to lay before the Commission from a statistical point of view, but I do think that when I bring the statistical evidence forward it will prove that in all probability the diarrhoea, which has been a prevalent cause of death in Leicester, has been increased by some special cause, and I know of no cause which at the present time can be assigned for it excepting vaccination.

13,855. (*Chairman.*) But let us take this fact: Leicester has not surpassed other towns in the amount of its vaccination during the last few years?—It equalled them at one period.

13,856. During the last few years it has been much below other towns?—That is true, and its mortality from diarrhoea has considerably declined.

13,857. I find that in 1886, when the number of vaccination cases had already considerably declined, there were 247 deaths caused by diarrhoea, and that the average annual number during the last 10 years, which takes us back to 1876, had been 231; so that the number in 1886, when vaccination had been declining for three or four years, was higher than the average for the 10 years which included the time when vaccination was much more prevalent?—And the population had become much larger; in those 10 years it would have grown nearly 30,000.

13,858. But it would not grow 30,000 all at once; the ten years' figure is taken on the average population over the ten years?—Yes, no doubt; but if you were to add the year you have cited, the year 1886, to the others, it would not materially raise the average mortality.

13,859. I am not dwelling upon the point that it was higher than the average of the ten years; but would you not have expected to find some very decided change in the death-rate from diarrhoea if the diarrhoea had been the consequence of vaccination?—When we get to my statistics on the death-rates, you will find that there was a decided change, and there are other facts which I am not prepared to give at the present moment.

13,860. (*Dr. Collins.*) As showing the danger of instituting a comparison with a single year, in the following report it is stated that only 148 deaths occurred in 1888 from diarrhoea as compared with 247 deaths in 1887?—That was so.

13,861. (*Mr. Whitbread.*) Have you any table to show that there is a difference in the proportion of children attacked by erysipelas who have been vaccinated, as compared with those who have not been vaccinated?—No, I do not think it would be possible to produce an absolutely correct return.

13,862. Why?—We have at present, in the first place, a new Medical Officer appointed four or five years ago, who is not thoroughly acquainted with what has taken place in the town in previous years; you might possibly be able to get that from the previous Medical Officer of Health, if he had kept memoranda apart from the Medical Reports.

13,863. (*Chairman.*) As Dr. Collins has called your attention to the year 1888, I might call your attention to the year 1889. In 1888 and the two years preceding vaccination had got to a very low ebb?—It had, very low.

13,864. In 1889 I see, "221 deaths were recorded from diarrhoea, which corresponds to the average number of the past 10 years. This is a considerable increase on the year 1838, which had a mortality much below the average. The death-rate per 1,000 of the population was this year equal to 1.4." (That will be the year 1889, when there was very little vaccination in Leicester.) "In the large towns of the country the rate was 0.82, so that as usual we were largely in excess, and, with the exception of Preston, had the highest mortality from this annual scourge." Now if vaccination is the cause at all, or a material cause at all, of infantile diarrhoea, how do you account for the fact that when Leicester had given up vaccination it still remained the town in all England with the worst record as regards diarrhoea except Preston?—Diarrhoea has always been practically an annual epidemic in Leicester. It is well known all over the country that Leicester suffers from this particular complaint; but I affirm again that when



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we come to the comparative tables we shall find that it has declined a great deal of late years.

13,865. That may be due to a variety of causes; but what I want to call your attention to is this: that if vaccination is one of the causes, ought not Leicester, when it has given up vaccination, to have improved a good deal instead of remaining, with one exception, at the bottom of the list?—That would depend upon many other considerations.

13,866. (*Dr. Collins.*) Would it not be a more material fact in ascertaining how far vaccination may have been a part cause in the production of the high death-rate from diarrhoea in Leicester, to institute a comparison between the death-rate in Leicester in recent years compared with the death-rate from the same complaint in years in which vaccination was more prevalent, rather than by instituting a comparison between the death-rate from diarrhoea in Leicester and the death-rate from diarrhoea in other parts of the country?—I think it would.

13,867. (*Professor Michael Foster.*) Would it not depend upon the existence of other causes tending to improve the condition of children?—I think it would.

13,868. (*Sir William Savory.*) Leicester has improved in sanitary condition of late, has it not?—It has.

13,869. (*Chairman.*) Supposing Leicester has improved compared with its previous years, other towns have also improved compared with their previous years; and if Leicester still stood in the same relation to other towns, would not that show that it was not the absence of vaccination which had improved Leicester, but some cause which was common to all?—No doubt it would. We find that diarrhoea in Leicester prevails more amongst the very young and the very old; the middle aged in life scarcely suffer from it at all; they suffer from it, but practically there is no mortality.

13,870. (*Professor Michael Foster.*) Do you propose to show the Commission that there is a relation between the decrease of diarrhoea and the decrease of vaccination?—I propose to show the relation between the practice of vaccination and the increase of the zymotics, and the Commission will be able to draw any conclusion they think proper.

13,871. Do you draw any conclusion yourself?—I shall propose to do so when I deal with the tables.

13,872. (*Chairman.*) We will postpone this part of the examination; it rather arose upon your view which was understood to be that parents were correct in attributing death to vaccination when it was followed by diarrhoea?—I did not mean that exactly. Sir James Paget put the question whether diarrhoea could not follow vaccination without vaccination being the cause, and I said I believed it could; but I said that if there was a definite period between the healing of the vaccination scars, that is to say, the recovery of the child from the vaccination—I am not speaking now of any serious effects of vaccination—but if a definite time elapsed between that and the commencement of the diarrhoea, then I think the parent would not be justified in attributing the diarrhoea to the vaccination.

13,873. Supposing that the diarrhoea occurred immediately or very shortly afterwards, before the healing of the vaccination scars, would it be right then to say that it followed from the vaccination when many children of the same age had on the same day developed symptoms of diarrhoea who had not been vaccinated?—Not in all cases.

13,874. What would be the circumstances which would justify you in connecting the two as cause and effect?—The parents are as a rule parents of a number of children, and they are able to judge of the effects of any operation upon their children; and where a disease is prevalent, as diarrhoea is in summer time in Leicester and carries off a number of children, I think it is a very easy matter for the parent to believe, and almost absolutely to observe, the depressing effects upon a child's health exercised by vaccination which may lead the child to suffer from a disorder which it otherwise might escape.

13,875. (*Sir James Paget.*) Have you any evidence to show that the proportion of the children who have been

vaccinated recently and have had diarrhoea is greater than that of those who have not been vaccinated?—I do not think that point could be ascertained without a special inquiry were made upon it.

13,876. Upon what ground of real fact is it to be believed that vaccination does produce diarrhoea?—Broadly upon this ground, that it excites the system of the child in some way or other, and where a disease is epidemic it is in all probability an exciting cause of increasing the epidemic fatality.

13,877. That is a belief, but is there any fact showing it?—The facts are these: that at the time we vaccinated up to 90 or 95 per cent. of the births our death-rate from diarrhoea was higher than either in the preceding or succeeding periods of which we have records.

13,878. May not the explanation of that be that you have greatly improved the sanitation of the town?—It would not apply to that for this reason; that after the severest mortality from diarrhoea the sanitary condition of the town in some respects practically got worse.

13,879. But are those respects such as would apply specially to diarrhoea?—Yes; I have no doubt of it.

13,880. How do you explain the fact that in towns where vaccination is carried on very largely the mortality from diarrhoea is considerably less than in Leicester?—The point is those other towns never have suffered much from diarrhoea, and therefore vaccination could not be the exciting cause in a town where it did not prevail. I am simply referring to Leicester as a town in which it does prevail, and stating my belief that, where epidemic diseases are prevalent, an operation like vaccination may become an exciting cause of those particular diseases to which the district is especially liable.

13,881. But would it not be a strong contrast between two towns if in one town 90 per cent. of the children were vaccinated and in Leicester only five, and yet Leicester had the highest mortality from diarrhoea?—I do not see how the contrast could be drawn unless the first town which was vaccinated to the extent of 90 per cent. had been known to be a town subject to diarrhoea. I have never stated that vaccination was the cause of the whole of the diarrhoea.

13,882. Then what is the evidence that vaccination is the cause of any part of it?—I propose producing evidence of that character; but we are rather anticipating what I propose to produce later on; and I would beg permission to reserve that branch of the case for the present.

13,883. (*Chairman.*) It is necessary to understand clearly the position you take up with regard to the extent to which you think the statements of the parents ought to be accepted that a certain disease has resulted from vaccination, even though the medical man who attended the child did not take that view; one wants to see whether the evidence is sufficient to warrant that belief; as far as I understand, your view is that if there is a disease like diarrhoea prevalent, and it attacks a child shortly after vaccination, we therefore may fairly conclude that vaccination has had to do with it?—Under certain circumstances.

13,884. What are the circumstances?—I have already described the circumstances: that if before the child has recovered from the effects of vaccination diarrhoea sets in, I do not say in every case it is caused by vaccination, but in all probability it is the exciting cause. And I say that our statistics go to show that we had the greatest mortality from diarrhoea at the time we had the greatest number of vaccinations.

13,885. But why? If you have greater infant mortality from diarrhoea than other towns which have more vaccination, how do you show the vaccination to be the exciting cause?—I believe that if we had suspended vaccination our infantile mortality would have been very much lower.

13,886. Why?—Because I believe that as diarrhoea is annually epidemic in Leicester, vaccination is one of the exciting causes producing it in children when they are very young.



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Mr. WILLIAM SMITH examined.

13,887. (*Chairman*) You are a shoe-rivetter at Belgrave, Leicester?—Yes.

13,888. You are the father of nine children?—Yes.

13,889. The first five were vaccinated, and the four subsequent children were not vaccinated?—That is so.

13,890. The last of your children vaccinated was a daughter, born in December 1880?—Yes.

13,891. Did she suffer from vaccination?—Yes, very much.

13,892. In what way?—When her arm was at the height, before the ninth day, it was a dreadful sight, with running sores from the elbow to the shoulder, and it spread from the shoulder to the chest, from the chest to the face and all over the head; she was a dreadful sight, and she has very deep scars up to the present time.

13,893. Was she attended by any medical man?—Yes.

13,894. Who was that?—Dr. Dalley, of Syston.

13,895. How long was it before she recovered?—She never has thoroughly recovered yet, her face was covered with running sores for close upon two years. Dr. Dalley attended her from eighteen months to a year and nine months. I could not say justly to a few weeks, but something like that, not under 18 months, and then he told us we had better take her to the infirmary. Of course we did not take her to the infirmary. There was a friend of mine who was a quack doctor, and he gave me some stuff to rub upon it, and it healed it up, but she shows very deep marks up to the present time, and up to the present time there is blood and matter runs out of her mouth every night. It does not run out during the day time, but it runs out in the night when she is in bed.

13,896. In 1885 you were summoned in respect of the non-vaccination of another child, were you not?—Yes.

13,897. You took this daughter then to the Court, did you not?—Yes.

13,898. You alleged that injury which she had sustained as a reason for not vaccinating the other child?—Yes.

13,899. That summons was allowed to lapse?—Yes.

13,900. You were summoned again in June, 1887?—Yes.

13,901. In respect of another child?—Yes, in respect of a child named Walter.

13,902. You were fined 10s. and 13s. 6d. costs, or seven days' imprisonment?—Yes.

13,903. And you went to prison in October?—Yes.

13,904. And in October 1888 you were again summoned and fined?—Yes.

13,905. (*Mr. Picton*.) What led you to connect the injuries that your child suffered with vaccination?—Because the child was not vaccinated until she was six months' of age, and up to her vaccination she was as clear as it was possible for a child to be.

13,906. She was considered altogether healthy?—Not a healthier child we ever had in the family. She was as healthy as any one of the rest, but when the arm was so bad it spread to her chest and her face.

13,907. Did Mr. Dalley express any opinion as to the cause of this condition?—I asked him several times

what was his opinion upon the subject, whether he thought it would be due to his vaccination, and he said, "Oh, no, nothing of the kind."

13,908. Did he give any opinion as to what was the cause?—In talking to him in his surgery he told me that if I had had the child vaccinated his way she would not have been in that state. I asked him what his way was, and he told me: "If I had made four marks in that arm she would not have been in that state." I told him that I would either bring the child over or he might call and see the child; that he had made the four marks, which had run into one large place.

13,909. Is it the case that you had to watch her for six weeks, night and day?—Yes.

13,910. Did that interfere with your work?—It did very much.

13,911. When you went to prison, how were you treated?—I was fetched from my home on Monday night and taken to the county office, and from the county office to prison. I had to deliver up all that I had in my pockets, and then I was put into a cell. Being night it was very dark in the cell, and I had to lie in the cell all night with the window open. I did not know that the window was open, but still I knew that it was very cold.

13,912. Had you to undergo a medical examination?—Yes, the next morning.

13,913. You were treated in all respects as a common criminal?—Yes, just the same.

13,914. (*Mr. Meadows White*.) Just in the same manner as persons who did not pay their fines, and were sent to prison, were treated; there was no special case made of you?—No, there was no difference made for me.

13,915. Were you in a position to pay the fine; what was it?—10s. and 13s. 6d. costs.

13,916. You could have paid it?—Yes.

13,917. (*Dr. Collins*.) Did you have any work to do in the prison?—Yes; they came and opened the cell door on the Tuesday afternoon and told me I was to fetch some oakum; I went and fetched some, and they got on to me sadly the next day because I had not done all of it. They asked me what I had been doing, and I said I had been reading and writing on the slate and picked a bit of oakum when I felt inclined. They told me I had not come there to read; and I asked them what did they put books there for me to read if I was not to read them, and they told me if I did not get everything done the next day I should be punished; but I did not do it because I thought I should not be forced to do it.

13,918. Have you had any other children?—Yes.

13,919. Have you had them vaccinated?—No.

13,920. (*Mr. Meadows White*.) Would you have them vaccinated?—No; I would sooner be fetched up to spend seven days every other week than be forced to do it.

13,921. (*Sir Charles Dalrymple*.) Did Mr. Dalley come to vaccinate the child?—Yes, and I had always told the missus not to let him do it too much. In this case he had his own way. That child is a living witness to every word that I say.

The witness withdrew.

Mr. JOHN THOMAS PAYNE examined.

13,922. (*Chairman*.) You are a shoe rivetter, living at 58, Outram Street, Leicester?—Yes.

13,923. Were you formerly a believer in vaccination?—Yes, I was for a time.

13,924. Your first child was vaccinated?—Yes.

13,925. Did he suffer from vaccination?—Yes, a great deal, for years.

13,926. In what way?—In having sores coming all over him. It affected him so much that he had abscesses. I believe, altogether, he had 13 abscesses one after the other; he had as many as three at a time.

13,927. Your next child was a daughter?—Yes.

13,928. She was vaccinated at four months old?—Yes.

13,929. Did she suffer?—Yes, from about a fortnight or three weeks after she was vaccinated she gradually broke out into sores from head to foot. She was one complete mask, until it brought her into convulsions. I had Dr. Sloane, and his assistant came about two days before she died. I asked the reason of the child's being so ill, and he said there was not the least doubt of its being through unsuccessful vaccination. I said, "Why do you not put it on the certificate?" and he said, "I dare not."

13,930. Who was that?—The assistant of Dr. Sloane.

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13,931. Do you remember his name?—I do not, but I am confident of his being assistant to Dr. Sloane.

13,932. Was that in 1874?—No, 1875; the child was born in 1874.

13,933. You did not have any of your children vaccinated after that?—No. I have eight children now alive, who have not been ill a day, excepting with whooping-cough and measles.

13,934. Have you had eight children since 1874?—Yes.

13,935. You were first summoned in 1876?—Yes.

13,936. You were fined 20s.?—Yes.

13,937. You did not pay the fine, but went to prison in December 1876?—Yes.

13,938. In July 1878 you were again fined for another child, and again went to prison?—Yes.

13,939. On that occasion did you suffer from illness?—It was in July; the sun was very hot; I had been subject to rheumatics for some time, and when I was put into the van it was scorching hot, and I felt very sick and faint when I got into the cell; it was no use looking for water. The borough and county gaol is very different now from the first time I went in. There was no water there. Then I went into the reception place to pass the doctor. I was so ill that the consequence

was I fell out of the hammock I slept in at night down on to the cold floor, and I thought I should not live to come out again.

13,940. Accordingly you wrote to your friends, and they paid the fine?—Yes, on the Saturday night.

13,941. You have been summoned twice since then, I believe?—Yes.

13,942. But you have not obeyed the orders?—No.

13,943. (*Mr. Meadows White.*) Did you inform Dr. Sloane of what his assistant had said?—No, I did not.

13,944. (*Mr. Picton.*) Do you know whether the assistant was a qualified medical man, or was he only a youth beginning?—No; he was a man, I should think, of 35 years of age.

13,945. Then he was actually taking Dr. Sloane's practice?—Yes, he used to see the children in Dr. Sloane's absence.

13,946. You are sure he told you that about the vaccination?—Yes, I followed him out into the yard and asked him particularly, and he told me that in the corner against the door.

13,947. Are you quite resolved not to have your children vaccinated?—Never no more, if I have 40.

The witness withdrew.

Mr. HARRY HACKETT examined.

13,948. (*Chairman.*) You are a journalist, living at Evington Street, Leicester?—Yes.

13,949. Your first child, a boy, was born in March, 1878?—That is so.

13,950. And was vaccinated by Mr. Clarke?—Yes.

13,951. Did he suffer from vaccination?—I believe so.

13,952. In what way did it show itself?—Shortly after the operation had been performed an eruption broke out in the head, and lasted for, I should think, 12 months. The whole of the head was covered, and subsequently the injury appeared in the limbs and in the back, more especially under the knee and at the wrist and the elbow joints.

13,953. Did you consult any medical man?—Yes, in 1887 I consulted Dr. Clifton.

13,954. That was when the child was 11 years old?—Yes, about that age.

13,955. Had the sores continued down to that time?—Yes, and he had been under Dr. Clarke more or less all that time. I should like to say with regard to Dr. Clarke that I make not the slightest complaint of him; he has been my medical attendant all the time, and he is my medical attendant now, and attended us last year, and I have the highest opinion of his judgment and conscientiousness. I should also like to say with regard to Dr. Clarke that I believe he acted with the utmost care.

13,956. When you consulted Dr. Clifton, did he attribute the illness to vaccination?—He certainly did. I laid before him the whole of the facts, and he stated that, in his opinion, it was due to vaccination, and in his view the child would have to be treated almost as a small-pox patient, and he gave us certain instructions, which we acted upon. The child is very much better now, but I cannot call him well.

13,957. You have had, I believe, three other children, none of whom have been vaccinated?—I have four other children who have not been vaccinated.

13,958. Are they all unvaccinated?—They are all unvaccinated.

13,959. And none of them have suffered at all?—Not in the slightest degree.

13,960. (*Mr. Picton.*) The child was healthy until it was vaccinated?—Yes, perfectly. Dr. Clarke was rather sore because he had not the opportunity of taking lymph from him to vaccinate other children with. He said that when people had children so healthy as we had it was not fair to other parents not to take lymph from them to vaccinate their children; but my wife happened to be out when he called, otherwise he had intended to take some.

13,961. Has this boy been able to attend school?—Yes, he has been able to attend school; but during the time he was under Dr. Clifton he was away for six or eight months, and at other times too, so that he is backward; my second boy is in the same standard in the same school as he is now.

13,962. Did Dr. Clifton give you a certificate?—Yes, he gave the certificate which is usually given to the school authorities in cases of illness.

13,963. You have had some experience as a journalist?—Yes, I began reporting when I was 14, and I am now 37.

13,964. You have been resident and actively engaged in the town during the progress of the agitation?—Yes, I have.

13,965. Can you indicate in a word or two the main causes which have led to the prevalence of the agitation?—I believe the opposition to vaccination in Leicester, especially to compulsion, has dated for the most part from the epidemic of 1871-72. At that time the town was a well vaccinated community in every sense of the term. Then the epidemic arose, and after that the objection to vaccination grew, and I may say it grew in spite of the not always very careful and very conciliatory arguments of those who were opposed to vaccination.

13,966. You say it originated in the epidemic of 1872; how could it be caused by the epidemic?—I believe that the people found that the practice of vaccination did not protect.

13,967. Was it the case that they observed that it did not matter whether a man was vaccinated or not, that he took small-pox all the same; was that the impression made upon their minds?—Yes; at any rate the opposition to compulsory vaccination has grown in Leicester from that time; at that time it was scarcely possible to raise the question at a public meeting in Leicester without causing a great howl of indignation. I remember that the first movers in the anti-vaccination crusade in Leicester could hardly get a hearing at a public meeting at one time.

13,968. Is that the case now?—No. The feeling of opposition has permeated all classes alike.

13,969. Do you think it is spreading?—Yes, out of 4,000 births in a year there are only about 200 at a full estimate who are vaccinated.

13,970. Do you think it would be possible to enforce vaccination in Leicester now?—Not unless you apprehended the whole town.

13,971-2. (*Dr. Collins.*) Was there any name given to the complaint from which your child suffered?—At first Dr. Clarke said it arose from teething; but when the

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child had got all his teeth he said it arose from eczema. Dr. Clifton is a homœopathic practitioner.

13,973. (*Mr. Meadows White.*) There has been a crusade against vaccination in Leicester?—Yes.

13,974. (*Professor Michael Foster.*) Were not there agitators before 1871?—There were agitators before 1871; but they had no popular following, and they could scarcely get a hearing in a popular assembly.

13,975. But they were active before 1871?—Yes, there were a few, but not many, to my recollection.

13,976. (*Sir Charles Dalrymple.*) Have you confronted Dr. Clarke with Dr. Clifton's opinion?—No.

13,977. Is Dr. Clarke aware that you obtained an opinion from Dr. Clifton as to the source of the illness?—No, Dr. Clarke is an allopath, but Dr. Clifton is a homœopath.

13,978. Dr. Clarke, as I understand, has never admitted that vaccination is the cause of the mischief?—No, but Dr. Clarke has never pressed me to have my other children vaccinated.

13,979. Did Dr. Clarke adhere to the opinion that the cause of the illness was eczema latterly?—I have not consulted Dr. Clarke recently. I have acted under instructions we had years ago, and I am glad to say that the child is gradually, I hope, growing out of it, but he is certainly not well yet.

13,980. Why, if you have such confidence in Dr. Clarke as to retain him as your medical adviser, do you distrust him upon this particular subject?—Because of my experience.

13,981. Would you set your experience against medical theory?—Not in a case in which I had had no experience. I may say this is not the only case I have seen. I have seen and heard of other cases in Leicester, which I believe to have arisen from vaccination. I remember a woman showing a child to me in which the punctures of vaccination had run into each other, making a wound about the size of a florin; the arm was apparently gradually being eaten away.

13,982. (*Chairman.*) Have you seen any cases of

eczema, apart from vaccination?—No, but I have heard of them.

13,983. But you have had no personal experience of the disease of eczema, speaking apart from any question of the cause of it?—I have not.

13,984. (*Mr. Picton.*) You have mentioned one case brought to you to show to you, I suppose, as a journalist; have you had any others?—I have not had children brought to me, but I have had medical certificates brought to me.

13,985. Showing that vaccination has been the cause of death?—Yes.

13,986. Could you recover them?—I am not sure whether I could. I had them in my possession a few months ago. I thought Mr. Biggs had them, and I may have destroyed one or both. If I had not the certificates themselves I had a copy of them which was taken at the time.

13,987. Do you trace much of the present state of opinion to those cases?—I have not the slightest doubt that a considerable amount of the opposition felt in Leicester to vaccination has arisen from the injury which has been shown to result from the operation.

13,988. (*Mr. Meadows White.*) Does the journal that you represent take any part in the discussion of the question?—Yes.

13,989. You publish letters on both sides?—Yes; but we do not get many of them now on the side of vaccination.

13,990. (*Sir James Paget.*) Were the certificates you mentioned certificates of death?—Yes.

83,991. Was vaccination mentioned as the cause of death?—I remember it was in one; I am not quite certain about the other. I remember perfectly well cases of death arising at Hinckley from vaccination, it was with regard to those cases that the certificates came into my possession; some particulars of them were published at the time; I remember it very well.

13,992. (*Mr. Meadows White.*) You cannot remember the names of those cases?—I cannot remember the names of those cases.

The witness withdrew.

Mr. GEORGE SADDINGTON examined.

Mr. G.  
Saddington.

13,993. (*Chairman.*) You are a frame-work knitter, residing at Leicester?—Yes.

13,994. In 1868 the Guardians passed a special resolution that a prosecution was to be instituted against you for failing to comply with the vaccination laws?—I believe that was so.

13,995. You were summoned on December the 4th, what was the result of the case?—I was determined not to have my children vaccinated. I had then five children unvaccinated; three of them had lived through the epidemic of 1864, and they had not the small-pox, although we had it in the same street as we lived in. When before the magistrates I did not understand the nature of the law, and through the advice of friends, my eldest child said she would rather be vaccinated than that her father should go to prison, and I submitted them to the operation; at the same time I protested against it.

13,996. Was that your eldest child?—The eldest one unvaccinated said she would submit to it, my first born I had vaccinated.

13,997. Have you taken a part in forming a committee which resulted in the establishment of an anti-vaccination league?—Yes, I was one of the two men that went round Leicester to try to get a committee together to take action against the law, because I believed the law was a wrong one.

13,998. Do you mean wrong in compelling it, or that vaccination was wrong?—I believe that vaccination is wrong in principle.

13,999. Upon what grounds, in what sense do you think it wrong in principle?—I believe it is a violation of nature's laws for one thing. I think it is pregnant with evil, and that it is not a preventive of small-pox.

14,000. (*Professor Michael Foster.*) At what date did you form this committee; in what year was it?—I am not certain now whether it was the latter end of 1868

or the commencement of 1869. About that time there was a committee formed in Leicester, and I was one of the committee.

14,001. (*Chairman.*) In August 1871 you were again summoned, and you were fined, and you went to prison on that occasion?—I went to prison.

14,002. There was a fine imposed, and you went to prison in default of paying it?—Yes.

14,003. That was for a different child, I suppose?—Yes.

14,004. You were also fined in September 1873, in March 1876, and in July 1881?—Yes.

14,005. Those latter fines you paid?—Yes.

14,006. Was there more than one summons in respect of the same child, or were they all in respect of different children?—In respect of different children; they did not take action against me in the way of repeated prosecutions.

14,007. (*Mr. Picton.*) You remember the epidemic of 1872 in Leicester, do you not?—Quite well.

14,008. You were then agitating against vaccination, were you?—Yes.

14,009. Did the result of the epidemic prevent the success of your agitation, or did you make progress during the year of the epidemic?—That I cannot say now.

14,010. Leicester was well vaccinated then, was it not?—Yes, Leicester was well vaccinated at that time. I might say, for the information of the Commission, that I lived in Birstal Street at that time, and there were more deaths in that street than in any other street in Leicester. There were 15 deaths, I believe, occurred in that street.

14,011. Did your friends that were working with you then take care to notice the effects of vaccination on small-pox?—Yes.



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14,012. What was their impression?—Their impression was that vaccination was not a preventive of small-pox.

14,013. Did they find that their neighbours and friends who had been vaccinated took small-pox just the same as others?—Yes, I believe that was so.

14,014. They were led to think that it made no difference, in fact?—Yes; if I might be allowed, I perhaps could give you a little information. When I was before the magistrates in 1873, I think it was, I wanted to make a few remarks from Dr. Crane's report, and I was prevented from doing so. The magistrates told me they were there to administer the law, and not to listen to a speech or a defence; they did not treat us with that courtesy which I thought they might do at the time, and although I was not a writer I asked a friend who could write, and he wrote a letter for me, partly at my dictation, and it was published in the "Daily Post," some time in September, I believe, in 1873; we showed in that letter that there were more people died in 1872 (speaking from memory) than there were in the previous 20 years. In the epidemic of 1864, which was the greatest epidemic between 1852 and 1872, there were 104 deaths, I believe, from small pox; but in 1872, I believe, there were 330 or 340. I am now speaking from memory. I would not speak positively upon that point, not having Dr. Crane's report with me. I did not think it necessary to bring it with me. Although in my letter I wished that report to contradict the magistrates, that letter was never answered; but I might say that the letter which appeared in the "Post" was signed "George Saddington." There was an "L" put, I believe, in place of the "S," but, at the same time, my address was there, so that the magistrate might have known who it was from, and they knew I was before the magistrates

a few days before that letter appeared in the newspaper; but it never was answered, I believe. I feel certain it was not.

14,015. When you were taken to prison were you handcuffed?—Yes, I was handcuffed to a man, I cannot say what his crime was.

14,016. You were treated as a common criminal?—Yes, I was.

14,017. You have never since then had a child vaccinated, have you?—No, not since that time.

14,018. (Dr. Collins.) We have been told that before 1872 there were no effectual means for enforcing the law, do I understand you to say that it was in 1871 that you went to prison; what was the first year you were fined under the Vaccination Act?—I must explain this, that although the vaccination law was made compulsory in the year 1853, it remained, I believe, as it were optional.

14,019. What was the first year in which you were fined?—In 1868, I was brought before the magistrates and submitted the children to the operation, that is what I have stated before.

14,020. What is the date of the next summons?—When I went to prison was the 20th of August 1871.

14,021. That would be before the new Act came into operation, which was in 1872?—In 1872 there was a slight alteration and amendment to the Vaccination Act, I believe; but in the year 1867 there was also an amendment made.

14,022. You were imprisoned under the Act of 1867?—That was so, the year 1868 was the first year that we had a Vaccination Officer in Leicester searching up defaulters who did not comply with the law.

The witness withdrew.

Mr. HENRY MATTS examined.

Mr.  
H. Matts.

14,023. (Chairman.) You were formerly in business as a plumber and glazier in Leicester?—Yes.

14,024. But you have now retired from business?—Yes; I now live at No. 9, Gotha Street.

14,025. In February 1871 were you summoned for the non-vaccination of your three children?—Yes.

14,026. Aged seven, nine, and twelve?—Yes.

14,027. Had any proceedings been taken against you previously in respect of those children?—I was first summoned on the 22nd of June 1870 for an infant named William; that infant died on the 28th of July, the same year; after that they continued to summon me for three other children, aged seven, nine, and twelve; in the course of time (I believe it was on the 27th of February 1871) they committed me to prison for 30 days, or 3l. to pay.

14,028. You went to prison?—I went to prison, having been an anti-vaccinator all my life I might say.

14,029. In prison, notwithstanding your protest, your beard and whiskers were shaved of?—Yes, they were. I resisted first when I came to the gaol. They said "Sit down." I said "Are you going to take my whiskers off?" And they said "Yes, sit down." I refused to sit down. They said "What do you want?" I said "I think I ought not to be treated as a common felon, are you going to take my whiskers off?" And they said "Yes." I said "I shall not submit to that." "What do you want?" they said? I said "I want to see the governor, Mr. Marshall." They went away ultimately, as I persisted that I wanted to speak to him; and in three quarters of an hour they came again and they said, "Sit down, we are going to take your whiskers off." I said "I want to see Mr. Marshall." They said "He will not see you, he is out now." Believing it to be legal, I sat down, and they cut my hair and shaved my whiskers off from one ear to the other. I felt that it was a great indignity, but as it was the law as I thought I submitted to it. I should not have submitted to it otherwise, as I went there entirely for conscience sake, because I could not give my consent to have my children vaccinated.

14,030. I believe a suggestion was made after you came out of prison that you should bring an action against the governor?—Yes, my solicitor, Mr. Reeve, the Clerk of the Peace for the county of Leicester and a Justice of the Peace for the borough, sent for me the next

day. I went down, and he said "Why, Mr. Matts, you have had your whiskers taken off." And I said "Yes, I have." He said "I am very indignant indeed at having a client of mine treated in that kind of way. I shall certainly enter an action against them if you will permit me." I said "I will" at first, but as he was writing it down, I happened to say to him "What will be the result if I go on with this action?" He said, "The result will be that Mr. Marshall will lose his situation." Oh! dear. I said, I could not go on with it then, and that I should withdraw it. He said, "Why withdraw it? They had no mercy upon you, why should you have any upon him?" I said "I know Mr. Marshall very well and should be very sorry for him to lose his position because I am an anti-vaccinator." He said "I wish you would go on with it, it is a shame to see a respectable man like you made to look such a sight;" but I said I could not go on with the case, I could not do him that injury.

14,031. (Mr. Picton.) Mr. Reeve regarded the matter with very great indignation?—Yes; I had known him for many years.

14,032. Have you known him to take up other cases of what you thought abuses?—No, he was a vaccinator. I was pulled up before the magistrates several times, and I employed a solicitor and he got me off the first time, but ultimately they committed me to prison.

14,033. Could you tell us anything of your moral treatment in prison apart from your physical treatment, in what way your offence was regarded by the governor and the chaplain?—I think they treated me very roughly indeed, looking at the course they took with me in several different ways. One of the clergymen told me my children did not belong to me but to the State. I said why don't the State keep them then. I thought this fine consolation and advice.

14,034. Were you reasoned with as to your conduct?—Yes, the governor, Mr. Marshall, came into my cell one morning and he said "I am very sorry to see a man like you here Mr. Matts: this place was never built for men like you." He knew me, and I knew him. I said "Why do they send me here then? I dare not have my children vaccinated." He said "You anti-vaccinators are a mere bundle of straws, only a handful, the authorities will crush you clean out." I said "No, you are making a mistake, I shall live to see the time when there will be enough anti-vaccinators to



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"pull this gaol down and to throw the bricks at your head"; and I am thankful to say that I have lived to see enough people in Leicester to-day to do it, for the feeling is almost universal. I am sorry they should have made it compulsory and binding upon inoffensive men. I never came before the magistrates in my life till I was pulled up for resisting the Vaccination Act. I am naturally a loyal subject, and it is the greatest trouble to me to come in conflict with the law.

14,035. (*Mr. Picton.*) You were brought before Alderman Stafford and Mr. John Baines?—Yes.

14,036. What did they say to you?—They came to the gaol to see me.

14,037. But I mean in the court, before they sent you to prison; did they say they had no power but to carry out the law, did they express any sympathy with you?—I believe they did talk to me; they said something to this effect: "What do you come here for, I thought you 'had been a better man.'" Then they came to visit me when I was in gaol, they said "What do you do here" "Matts, we thought you had been a better man than to 'come here.'" I said "What had they put me here for." "I dared not have my children vaccinated."

14,038. The magistrates were bent upon carrying out the law then?—Yes, Alderman Stafford was rather stern and abrupt; he was a vaccinator at the time; he is now, I am happy to say, on our side against compulsion.

The witness withdrew.

Mr. CHARLES EAGLE examined.

14,044. (*Chairman.*) You are a shoe laster living in Belgrave, Leicester?—Yes.

14,045. Your first child born in September 1871 was vaccinated when four months old?—Yes.

14,046. And was used as a vaccinifer; that is to say, to obtain lymph from for other children?—Yes, for private practice.

14,047. The second child was born in April 1874, and vaccinated in July 1874?—Yes.

14,048. Did it show any other than the symptoms usually arising from vaccination upon the arm?—Yes, not particularly on the arm, but all over the system.

14,049. What sort were they?—A kind of eruption all over its body. Here is the bill I had to pay to the doctor.

14,050. Did the child ultimately die?—It died when six months old; it was never a healthy child afterwards; it died of diarrhoea.

14,051. Then it died about three months after the vaccination?—Yes; I asked the doctor if the vaccination had anything to do with the eruption on the body, and he said, "Oh, no, if the vaccination had had anything at 'all to do with it it would only have appeared in the 'place where it was vaccinated,'" that was his theory, but of course it was not mine.

14,052. Who was the doctor?—Dr. Denton.

14,053. Did the eruption continue till the time of its death?—No, it went off, as near as I can remember now, in a fortnight to three weeks after vaccination.

14,054. You have had none of your children vaccinated since?—No.

14,055. How many unvaccinated have you now?—I have six unvaccinated now.

14,056. You have been fined three times, I think?—Yes.

14,057. And twice you have gone to prison?—Yes.

14,058. (*Mr. Meadows White.*) In respect to different children?—Yes, in respect to different children. I have had six children since, and been fined for three. In one case I gave the authorities the go-by by moving, two I have not heard anything about; I suppose they have got tired of me. I was in prison on the 8th of May. I was the last man who was handcuffed in the borough of Leicester. Mr. P. A. Taylor asked a question in the House of Commons about it; we had a large demonstration in Leicester against my imprisonment. It was the first demonstration we had against the Vaccination Act.

14,059. (*Chairman.*) When was that?—In May '876.

14,060. Was that after the time when you had been handcuffed?—Yes, it was upon the 17th of May 1876 that we held a demonstration.

14,039. You have never had any of your children vaccinated?—Never. I was always an anti-vaccinator.

14,040. Did you receive any summons after that imprisonment?—No, they never interfered with me in any way after I went to gaol.

14,041. Do you know why?—Mr. Reeve said "I think 'they have had enough of you Mr. Matts, they will not interfere with you again.'" I said "I hope they will 'not, if they do I will not allow such a thing as to have 'my child vaccinated but would go to gaol again and 'again.'"

14,042. (*Dr. Collins.*) I understand you were imprisoned in the year 1871 under the Vaccination Act of 1867?—Yes, that is correct.

14,043. (*Mr. Meadows White.*) Of course you were in a position to pay the fine?—I was in a position to pay the fine, and my uncle, Mr. Alderman Norman, came to the prison at the time, and he said "go and tell my 'nephew Mr. Matts that I will pay the fine if he will 'come out,'" and I said "tell him if he does that I shall 'regard him more as an enemy than as a friend. 'I 'insist upon the law being repealed. I can see no way 'out of it. I cannot submit to it, my conscience will 'not allow me to do so;" the result was he went away. I would not listen to the proposal.

14,061. And you were sent to prison on the 8th?—I was sent to prison for ten days.

14,062. The man you were handcuffed to was drunk, I believe?—Yes, he had smashed a bottle upon a policeman's head; I was handcuffed to him. The policeman took a piece out of my wrist at the time he did it, he did his work so clumsily.

14,063. In 1881 you were fined 10s.; in 1886 you were again fined 10s. and 11s. 6d. costs?—Yes, I was fined five shillings more that day than any one else.

14,064. In May 1887 were you arrested?—Yes.

14,065. Was that for non-payment of the fine?—Yes.

14,066. Were you handcuffed again?—Yes, I told the police I would not resist, but it was of no use. I was the last man that was handcuffed in the borough, and Mr. Cross, now Lord Cross, who was Home Secretary at the time I was handcuffed, said they had no business to handcuff a man who did not show any resistance. But my remonstrance was of no avail with any of the police officers; they came to fetch me at half-past one in the morning, and they fetched me out of bed.

14,067. Had there been a distress made before the imprisonment upon your premises?—No, they said I had not got sufficient goods according to what they told the magistrates.

14,068. Did you have them valued?—Yes, the auctioneer valued the goods at auction mart prices at 14l., besides a pig I had in the sty worth 30s.

14,069. The amount due at that time was 10s. and 11s. 6d. costs, was it not?—Yes; the reason given by the police for handcuffing me was that they said Eagle was a smart active young man. This is the report of Mr. Matthews's reply to a question in the House of Commons, he said: "He had obtained a report from the Chief Constable on the matter, who informed him that on the 7th of May a distress warrant was issued for 22s. 6d. 'on the goods of Eagle. On the 27th of May the 'officers went to the house to execute the warrant, but 'could not find sufficient distress. On Saturday, 28th, 'a warrant of committal was issued by the magistrates, 'and the police, who had reason to believe that Eagle 'was intending to go away by an early train on Monday 'morning, visited the house at 1.30 a.m. and arrested 'and handcuffed the man. It was no part of his (Mr. Matthews's) duty to express approval or disapproval 'of the course of conduct. He had already stated in 'the House that it was contrary to custom to use hand-cuffs except in case of actual necessity. In this case 'Eagle was an active young man, and from the manner 'he conducted himself the police officer thought that 'to handcuff him was the only safe course to take. 'The principle laid down by Lord Cross when he was 'at the Home Office was that handcuffs should not be



"resorted to unless there was fair ground for supposing violence would be used or an escape attempted. This was still the opinion of the Home Office, and from that there would be no departure." I have here the opinion of counsel in reference to that case as to the legality of it.

14,070. Was this advising the proceedings?—That was counsel's opinion as to the advisability of taking proceedings whether we should be likely to get a case against either the police officer or the magistrates.

14,071. You did not ultimately proceed?—No, we had not got money to throw away upon it.

14,072. (*Mr. Picton.*) Your second child Edgar, was he in a good state of health when he was vaccinated?—He was suffering from a cough at the time, and the wife asked the doctor if he would postpone the case, but he said "Oh, no; it would do the child good."

14,073. You were twice in prison?—Yes.

14,074. Each time as far as you know were you treated as a common criminal?—I received exactly the same treatment as the others in prison.

14,075. Had you to sleep on a plank bed the whole time?—The first time I had the plank bed the first night and a mattress afterwards; the second time I was imprisoned I had a mattress the first night and the plank afterwards.

14,076. You do not object to the enforcement generally of the laws made by the State?—Not of the laws in general. I have never been had up for any other kind of offence.

The witness withdrew.

Mr. WILLIAM BALL examined.

14,086. (*Chairman.*) You are a shoe rivetter living in Mount Street, Leicester?—Yes.

14,087. You have been opposed for some time to vaccination?—Yes, all my life.

14,088. Were you vaccinated yourself?—Yes.

14,089. What was the ground of your opposition to vaccination?—What made me first consider it was a brother of mine who died through the operation of vaccination.

14,090. Did he die as a child?—Yes.

14,091. He was younger than yourself, I suppose?—Yes.

14,092. How much younger than yourself, would he be?—He would be five or six years younger than me.

14,093. Is it from what you have heard from others, or from what you remember of the circumstances?—I remember seeing the operation, and following the disease, or rather seeing the effect of the operation, until his death.

14,094. What did he die of?—He died through the effect of vaccination.

14,095. In what way did it manifest itself?—In an awful swelling of the arm and various other ways in which it seemed to throw disease all over him.

14,096. (*Dr. Collins.*) At what age did he die?—I believe he was about nine months when he died. I know he was quite young.

14,097. (*Chairman.*) You have been fined more than once, I think?—No, I have never been fined but once.

14,098. That was in November 1883, 10s., and for not paying the fine you were arrested on the 23rd of November?—Yes.

14,099. At what time were you arrested?—It would be about seven o'clock at night.

14,100. You were helping to put the children to bed at that time?—Yes, we had just finished hearing them say their prayers and were putting the little ones to bed.

14,101. In prison you caught cold, I believe, and that developed into inflammation of the lungs?—Yes.

14,102. (*Professor Michael Foster.*) You were about seven years old, were you not, when your brother died?—Yes; it made such an impression upon me that I seemed to follow it all through my life, and studying the thing, reading what I could get hold of, and with the experience of my sisters and other people, that led me very seriously to consider the subject.

o 65090.

14,077. But you think this is an unreasonable law?—Yes, an unjust law.

14,078. And you hold that there is a difference between a man who conscientiously refuses to have his child vaccinated and a man who steals other people's goods?—Yes.

14,079. And you think they should be regarded differently if they are obliged to go to prison?—Yes, certainly.

14,080. Have you ever received compensation for having been handcuffed?—No.

14,081. Have you ever received any public testimonial?—I received a public subscription on coming out of prison the second time.

14,082. (*Dr. Collins.*) What work were you given to do in prison?—I had a bit of oakum to pick the second time; the first time it was unpicked oakum, weaved into mats, which was cut off, and I had it to plait together, but I did it at my own option.

14,083. You were not compelled to do it?—No; but one of the officials told me he had seen a man flogged for not doing more work than I had done.

14,084. The man that you were handcuffed to was charged with being drunk and disorderly, was he not?—Yes, that was the first time; the next time I was handcuffed to a policeman.

14,085. (*Mr. Meadows White.*) You were not treated differently so far as you know from other persons who had been ordered to pay fines and had not paid them?—Not that I am aware of.

Mr.  
C. Eagle.

25 Feb. 1891.

Mr.  
W. Ball.

14,103. Your sisters and the rest of the family were of opinion that your brother died from the effects of vaccination?—Yes; but for all that I have a sister who had some of her children vaccinated, and there were three of them that were in such a condition that their heads broke out and various parts of their bodies as well, that they were not fit for mortal eyes to look upon; it was sickening, the mother had to cover their heads up with a cap because they were not fit to look on. I vowed that if it pleased God I had ever any children for myself I could not see my way clear to have them vaccinated.

14,104. (*Mr. Picton.*) I think that at the time you were in prison you were a Sunday school teacher, were you not?—Yes.

14,105. Did anyone meet you on coming out of prison?—There were a great many of my Sunday school class, if not all of them, and there were thousands of people I have no doubt outside. Of course being a very steady man, and taking a very active part in most of the elementary things of the borough, such as Sunday school work, temperance work, and various other things, I was looked upon as being in a very respectable position; a great many of the working classes took a very great interest in me.

14,106. Did you find that you had lost any of their respect by going to prison?—Not at all.

14,107. Did your wife attend the sale of the goods of an anti-vaccinator?—Yes, she attended several; she attended one more especially which was held in the "Blue Boar" yard.

14,108. Did she say anything on that occasion?—She said to the policeman who was handling Mr. Booth rather roughly, "Do not use the man in that way;" he had got hold of him by the throat and got his collar off, and he deliberately knocked her down.

14,109. Did she suffer very much from that?—Yes, she did, because she was in quite a critical condition at the time, and a month afterwards she gave birth to a child.

14,110. Prematurely?—Yes, prematurely, its skull was completely knocked in, and its bowels were entirely dislocated. There are various other cases I could enumerate of injuries if any member of the Commission wish me to tell them any others.

14,111. Are they cases that Mr. Biggs is going to speak to, do you know?—No, all that Mr. Biggs has, I believe, are such as he has got certificates of, or pretty nearly so.



Mr.  
W. Ball.  
25 Feb. 1891.

14,112. You have not named those cases to Mr. Biggs, have you?—No, not the cases I could enumerate to you in which I know personally of injury from vaccination. I have a brother-in-law living at Narborough whose child was vaccinated two years ago, he did not have it vaccinated at the public office; my brother-in-law had a private doctor of Narborough to vaccinate it. Some time after the child broke out in its arm, and it had one of the most fearful arms I should think you will ever see in a photograph. When sending for another doctor this doctor declared that it was from the vaccination.

14,113. Did he tell you that?—He told the father of the child.

14,114. Did you see the child yourself?—Yes, the doctor that vaccinated it did not say so, it was another doctor whom they called in to attend to the sickness of the child, the doctor at Blaby. It was the Narborough doctor that vaccinated it.

14,115. You do not know his name?—I do not just now, but I know that when there was an examination made some time ago at the Blaby Board of Guardians, his reply to the inquiry was that he had never known any bad effect from vaccination, and at the same time there was this case which he had vaccinated himself, and in which the child was suffering at the very same time. Last year it broke out again upon the same child; the

mother is as strong and healthy a looking woman as you could ever see, and so was the child.

14,116. What was it, erysipelas or eczema?—It was more like erysipelas which followed. Then I have another case of a little boy next door but one to me where I live at present in Mount Street; he is an entire cripple in the use of his right arm, and never had the use of it since he was vaccinated.

14,117. What age is he?—About 9 years old; he has never had a paralytic stroke, but he has lost entirely the use of his arm from vaccination; we all laid it to that fact, the parents and all.

14,118. Did you see this child about the time of his vaccination?—I have seen him for nine years; his father owns the two houses adjoining me.

14,119. Do you know who was the doctor who attended that child?—I could not say that I do; it would be most likely vaccinated from the public office in the district.

14,120. But I suppose if the arm suffered in that way the father would have consulted somebody about it?—Yes, most likely he would have somebody to attend to it.

14,121. But you do not know who did?—No, I could not say who did.

The witness withdrew.

Mr.  
G. Frith.

Mr. GEORGE FRITH examined.

14,122. (*Chairman.*) You are a marine store dealer?—Yes, at Aylestone Park, just outside the boundary of the borough.

14,123. In February 1872 were you summoned for the non-vaccination of a child?—Yes.

14,124. And fined 20s. or 14 days' imprisonment?—Yes.

14,125. Was 14 days longer than the usual term?—Yes, four days longer.

14,126. Why did you get four days extra?—I do not know. The other gentlemen that were brought up at the same time had 10 days, and I had 14.

14,127. There was no explanation given you why you got 14 days?—No.

14,128. Did you serve for 14 days?—Yes.

14,129. Were you handcuffed when you were taken?—Yes, and dragged in by the policeman into the bargain, pulled through the door like a dog rather than a man; instead of leading me through the door, he dragged me in in a most brutal manner, he roused my feelings, and the governor put me in a dark cell for about three hours, when I never showed any violence in any way; I only spoke up rather loudly at his treatment.

14,130. You have been summoned altogether five times?—Yes, and I never had anybody vaccinated and

I never would. I do not believe in it. I have seen children well before they were vaccinated, and they were never well afterwards, children that I know. I was a resident in the borough of Leicester, and I was bred and born in Leicester, and I have lived in the neighbourhood the principal part of my life.

14,131. (*Mr. Picton.*) You are not residing in the borough now?—No, not in the borough, in the county.

14,132. Do you know whether the vaccination law is in force in your part?—Yes, they commenced again lately.

14,133. (*Dr. Collins.*) Have you received any notices lately?—No; I have no young children, the youngest is going in seven; I was prosecuted for that. It is 19 years last Sunday since I was prosecuted. On the clothing that I wore in prison there were 19 patches, and the rugs and blankets were not fit for a sweep, let alone for a respectable man, to sleep in. I vouch that for truth in the presence of all of you.

14,134. (*Mr. Picton.*) It was in 1872 that there was so much small-pox in Leicester?—Yes.

14,135. Did not the presence of small-pox frighten you into getting your child vaccinated?—No, it did not. I am not unnerved by anything of that sort. If cleanliness will not keep it away, nothing else will. I never did believe in it.

The witness withdrew.

Adjourned till Wednesday next at 1 o'clock.



## Fifty-eighth Day.

Wednesday, 4th March 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
 Sir CHARLES DALRYMPLE, Bart., M.P.  
 Sir W. GUYER HUNTER, K.C.M.G., M.P.  
 Sir EDWIN HENRY GALSWORDY.  
 Sir WILLIAM SAVORY, Bart.  
 Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
 Mr. JONATHAN HUTCHINSON.  
 Mr. J. ALLANSON PICTON, M.P.  
 Mr. SAMUEL WHITBREAD, M.P.  
 Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary*.

Mr. ROBERT HODGSON examined.

Mr.  
*R. Hodgson.*  
 4 Mar. 1891.

14,136. (*Chairman.*) You live in Kent Street, Leicester, and are a cabinet maker?—I reside at Birmingham now; I have removed from Leicester.

14,137. Your first child was vaccinated?—Yes.

14,138. But none of your other children were vaccinated?—No.

14,139. Why was that?—I have a statement which will explain the facts. I am 38 years of age, and was married in 1875. In the following year my first child Elizabeth was born, and, as I believed in vaccination, in due course I had her vaccinated, and apparently no ill effects followed. About 12 months after, in 1877, I removed to Bradford. While residing there one of my neighbours named Gair had a child vaccinated which suffered terribly. I saw the child, which was an awful sight and was dumb and an idiot. I was told by the parents that it was perfectly healthy before the operation. A few months after another neighbour named Stephens took her child (a fine healthy baby to all appearance) to be vaccinated. A week or two afterwards it became a mass of sores, and I saw it in that state. I shall never forget the distress of the mother. The child remained in that state during the whole time I was at Bradford, which was about 12 months. After that I saw several other children, one the daughter of Mrs. Palmer, Bell Street, Nottingham, also a child of Mr. Gair, of Nursling Street, Leicester. They were suffering from breakings out all over them, which followed vaccination. In 1881 I returned to Leicester, and in 1884 my second son Robert was born. About nine months afterwards I was summoned for its non-vaccination. I attended the summons, and an order was made for its vaccination within a fortnight. I was also ordered to pay the costs, 4s. I did not comply with the order, and shortly afterwards was summoned again before the Bench and was fined 10s. and costs. In 1886 my second daughter Edith was born. I was then living at 42, Prospect Hill, North Evington, just outside the borough of Leicester. I received a notice from the Vaccination Officer calling upon me to have the child vaccinated. Disregarding this notice, I received a summons dated 20th August 1887 to appear before the county magistrates on the 24th of that month. I appeared in due course and told the magistrates I was illegally summoned, as by the Vaccination Acts of 1874 the Vaccination Officer was compelled to personally inquire into the circumstances of my case before he was allowed by law to summon me. I may here state that it is part of the Vaccination Officer's instructions which are embodied in the Vaccination Acts.

14,140. You mean that failing compliance he shall without delay inquire personally into the circumstances of the case?—That, I believe, is part of the Vaccination Officer's instructions, which are embodied in the Vaccination Acts. The Vaccination Officer admitted in court that he had not personally inquired, and the magistrates themselves also stated that by law he was compelled to do so. They, however, fined me 1*l.* 1*s.*, including costs, and told me I might appeal against their decision; but as a fight between a working man on the one side, and a Bench of magistrates and a Board of Guardians on the other, seemed to me to be too

unequal, I was compelled to submit to "might" as against "right." I, however, laid the case before the Home Secretary, pointing out the illegal manner in which I had been treated by the magistrates. I also wrote to the clerk to the Billesdon Board of Guardians, asking him to lay the case before the Board at his earliest opportunity. Mr. Picton being ill at the time, I wrote to Mr. Bradlaugh, M.P., asking him to move in the matter, but unfortunately, as he courteously informed me, it was too late in the session, so I had to leave matters as they were. I have here the letter from Mr. Bradlaugh, which I should like to read: "Dear Sir,—Mr. Bradlaugh directs me to express his "deep regret that it is now too late to bring your case "before the House this session, otherwise he would "have great pleasure in being useful to you. Your "difficulty is that if you are right in your law you are "bound to raise the question on appeal, and not by "way of question in the House of Commons." On the 15th November 1887, after 9 o'clock at night, as I was attending to my wife who was seriously ill in bed at the time, two policemen in plain clothes came to my house, and, producing a warrant, said I must go with them. This made my wife much worse. I asked the officers when the warrant came into their possession, and they admitted they received it by the first post in the morning. I asked them why they did not execute it earlier, as they well knew where I was working all day; and was told that that day would count as one of my 10 days' imprisonment. I was then taken to all the public-houses around the neighbourhood to try and find some other defaulters, and having found them at home three of us were taken at nearly 10 o'clock at night to the county police cells. When there I was searched, taken to a cell, deprived of all my clothes but my shirt, and locked in for the night with another prisoner. My wife's illness, coupled with the time and manner of my arrest, brought about a miscarriage on the second day of my incarceration. The next day, November 16th, I was taken to the borough gaol, stripped and examined by the doctor, then brought out into an open corridor, and ordered to strip naked in the presence of some five or six prisoners. I was then dressed in the garb of a felon and taken to a cell, where I was fed on black bread and water, my only bed being a plank. I was ordered to pick 3 lbs. of oakum a day, even when my fingers were raw with sores and bleeding in trying to perform the task. I was kept in prison for 10 days, thus having been imprisoned 11 days, while only sentenced to 10. During the first few days of my imprisonment I suffered greatly from diarrhoea, consequent upon the coarseness of the bread, and my greatest punishment whilst in prison was being refused permission to leave my cell to obey the calls of nature, and when suffering exquisite pain; and on one or two occasions my request was denied with a filthy expression. When my 10 days, or rather 11 days had expired, I left the prison with my health impaired, having lost nearly a stone in weight through the treatment I had received. My conviction is strong that, although the provisions of the Vaccination Acts may be evaded by a Vaccination Officer or magistrate, or a rich person, they operate with cruelty on the poor man who happens to be prosecuted under them, and



Mr.  
R. Hodgson.

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who has, like myself, never been inside either police court or prison, excepting under this oppressive law. On coming out of prison I wrote to Lord John Manners; he was a representative then of the county I resided in, which was outside the borough of Leicester; and I received a reply from Lord John Manners, saying that I must obey the law of the land until it was altered; that was the only satisfaction I got from my representative in Parliament. It is only a few months ago since I recovered from a cough contracted in gaol. This cough left me very weak, and I have suffered from its effects until recently. Not very long ago I had to stay at home from my work for about three weeks in consequence, but I am now better. I am as strongly opposed to vaccination as ever, and would on no account submit a child of mine to the operation.

14,141. (*Mr. Meadows White.*) What was the cause of your being taken to prison, the non-payment of the fine?—Yes, the non-payment of the fine.

14,142. You refused to pay the fine?—Yes.

14,143. You could have paid it, I suppose; your position was such that you could have paid the fine?—

The witness withdrew.

Mrs. FANNY WOOD examined.

Mrs.  
F. Wood.

14,149. (*Chairman.*) You live at 24, Clara Cottages, Victoria Road, New Humberstone?—Yes.

14,150. Your daughter Constance was born on the 23rd of April 1888?—Yes.

14,151. And at five months old she was vaccinated by Dr. Nuttall?—Yes.

14,152. That would be in September?—Yes, it was.

14,153. She was afterwards taken ill, beyond the mere local effect of the vaccination?—She was taken ill the same night, the inflammation set in at once.

14,154. And her arms and hands and feet swelled?—Yes, becoming of a most unnatural size.

14,155. Were there any sores?—Yes, in 14 days three abscesses formed, and the head was one mass of sores.

14,156. Did Dr. Nuttall attribute it to vaccination?—Yes, when I told him I would never have another vaccinated, he said "I don't wonder at you saying so, its 'vaccination.'"

14,157. She died upon the 19th of November 1888?—Yes, when she was seven months old.

14,158. That was about two months after the vaccination?—I think it was eight weeks from the vaccination to her death.

14,159. The certificate of the cause of death was diffused cellulitis?—Yes.

14,160. Dr. Ballard came down from the Local Government Board to investigate the case and made a report upon it?—Yes, he did. (*See Appendix I V., page 489.*)

14,161. Now, with regard to the circumstances to which he refers, namely, the sanitary condition of the house; he mentions in the report that the drain in the yard was opened?—That was a month after the vaccination was done.

14,162. That was about half of the period between the vaccination and the death?—Yes.

14,163. (*Mr. Hutchinson.*) Were the vaccination sores healed at the time the child died?—No; they had eaten close to the bone; the arm looked as if it would really drop off; the child was all a mass of sores and abscesses; one was on the arm, one on the elbow, one on the back, and one on the throat; its head was one mass of sores.

14,164. (*Chairman.*) Are the statements in your summary, statements which appear in the report that Dr. Ballard made?—It is more the treatment of the child in Dr. Ballard's report, I think.

14,165. At fourteen days after the operation did the two vaccination marks develope into one large running sore?—Yes, they did; a very large one.

14,166. You have told us that there were abscesses upon the body; were there also sores upon the neck?—There were sores upon the head, and there were abscesses upon the back, and the two arms, and one in the throat.

14,167. Did Dr. Nuttall take lymph from the arm of your child?—Yes, upon the 1st of October, I think.

Yes, I could; but it was not merely the fact of not being willing to pay the fine that caused me to go to prison, it was the illegality of the thing; there was a special circumstance in my case as well as the objection to vaccination; the law was completely overridden in my case, I think.

14,144. (*Mr. Picton.*) Why were you taken by the police to the public-houses round the neighbourhood?—To find three more anti-vaccinators.

14,145. Are anti-vaccinators men much in the habit of attending public-houses?—No; as I stated, we found them all at home, and did not find any of them in the public-houses after all.

14,146. (*Mr. Meadows White.*) Those were the county police?—Yes, the county police.

14,147. Did you refuse to pay the fine on account of any principle?—Yes.

14,148. Upon what principle; what was your object in refusing to pay the fine?—My refusal to pay the fine was due to their having fined me illegally, as I thought.

14,168. That would be shortly after the vaccination?—Yes, upon the sixth day after vaccination.

14,169. Was that before any of the outward symptoms had developed?—Yes, the child had been very restless, and the inflammation was great; she never seemed to look up any more after the vaccination.

14,170. (*Mr. Hutchinson.*) Have you had other children vaccinated?—I had had six previously vaccinated.

14,171. Have they done well?—Yes, they have all done well except this one.

14,172. Had you any other illness in your house at the time?—Never, not the slightest. I had never had any other illness in the house during nine years.

14,173. During this child's illness did any other child become ill?—No.

14,174. Did you get sore fingers from dressing it?—No; Dr. Tomkins instructed me on that point, and also visited me.

14,175. (*Chairman.*) Dr. Tomkins was the Medical Officer of Leicester, was he not?—Yes.

14,176. He saw the child?—Yes, he saw the child, and I asked him what he thought of it. I asked him if it would get better, and he said it would have to make a very great alteration if it did—that it was in a very poor state.

14,177. (*Mr. Meadows White.*) What was the drain that was spoken of?—It was a drain in the next yard to ours; it was a connection into our drain, but it was a month after the child was vaccinated that that was opened.

14,178. What is the number of your house?—24, Clara Cottages.

14,179. You are speaking of the socketted pipe which was carried along the passage between your house and your neighbour's?—No, it was in the next yard.

14,180. Between your house and the next door?—There are Nos. 24 and 22 in the yard I live at, and the drains were carried from No. 20 over through the next yard.

14,181. There is a drain mentioned in Dr. Ballard's report, and I wanted to find out if it is the same drain?—Yes, it is the same drain that was connected with the large drain.

14,182. Is it near the pump?—Yes.

14,183. Passing between Nos. 22 and 24 by the pathway?—Yes, that is it.

14,184. That is what you are speaking about?—Yes.

14,185. When was that done?—I could not give you the date.

14,186. How long after the child was vaccinated?—About a month, in the middle of the time between the vaccination and the death.

14,187. (*Sir Edwin Galsworthy.*) How many children had you living there at the time when this child died?—Six; seven with the baby that died.



14,188. (*Chairman.*) Were they all at home at the time?—Yes.

14,189. (*Sir Edwin Galsworthy.*) How many rooms have you?—I have three large bedrooms and three rooms downstairs. They are very large bedrooms, larger in proportion than the living rooms downstairs.

14,190. (*Mr. Hutchinson.*) You have no reason to think that the drains made anyone else ill; I gather that from what you have said?—I have no reason to think they did.

14,191. The other six children, you have told us, were all quite well?—They were all quite well.

14,192. (*Mr. Picton.*) Were you put to much expense by this misfortune?—Dr. Nuttall gave me his attendance free and also the medicine and treatment; but it cost me a great deal for cotton wool, and the attendance I had to give the baby of course took all my time.

14,193. Is your time otherwise employed; do you do any other work?—Yes.

14,194. You earn wages?—Yes, I earn wages in the house.

14,195. And you were prevented from doing that work?—Yes. I was prevented from doing that work. I had to give it up whilst the baby was so ill. I neglected everything to try to save the child's life.

14,196. (*Dr. Collins.*) Have you received a copy of the report which Dr. Ballard furnished?—I did not receive it at the time, but I have seen it. Mr. Biggs showed it to me.

14,197. Then you did not have it from Dr. Ballard?—No, only from what Mr. Biggs showed me.

14,198. You told us how your child was upon the seventh day and the fourteenth day after vaccination; did I understand you to say that very shortly after the vaccination the arm itself became inflamed?—The arm became inflamed the same night as it was vaccinated—at tea-time in the afternoon.

14,199. How did it look the next day and the day after?—The inflammation increased a little the same day, and on the fifth day the lymph dropped off the elbow like peas; it seemed so unnatural compared to what the other children had gone through.

14,200. Would it be true to say that the house was not clean?—It is not clean now as regards the walls and ceilings, but it is not dirty as regards my own affairs. I was in the act of cleaning upstairs when Dr. Ballard came to me on the Friday morning: he found nothing more than a little loose dust upstairs.

14,201. Did you notice much nuisance arising from the fowl run or piggery?—No, I have not noticed anything by way of nuisance.

The witness withdrew.

Mrs. KATE HART examined.

14,216. (*Chairman.*) You live at 5, Lower Hill Street, Leicester?—Yes.

14,217. Your daughter Annie was born the 11th of February 1887?—Yes.

14,218. And vaccinated in the following June?—Yes.\*

14,219. By the Public Vaccinator?—Yes. (*See Questions 14,481-642.*)

14,220. Was she quite well at the time?—She was perfectly healthy at that time, and after she had been vaccinated three days she began to be ill, and about seven days after she began to swell in every joint that she had—her arms, knees, fingers, every joint in the child's body. They made three places upon the child's arm, two of which did not take at all, and on the one that took it went into a large black hole (it never made a pock mark at all) large enough to drop a pea in; that was after the child had been done about seven days.

14,221. Was the child taken to the Infirmary?—Yes. (*See Questions 14,824-920.*)

14,222. When did she go to the Infirmary?—Not for some time after that. I had it under Dr. Emms for five weeks; he said it was "water" on account of its eyes being swollen up so much. We feared the child would go blind on account of its eyes swelling so. I had it under him three weeks, then I thought I should like better advice. I ought to say I took it to Dr.

14,202. Has the inspector of nuisances made frequent calls in your neighbourhood?—He has made frequent calls in the neighbourhood; he lives in the neighbourhood; he called upon us last week, but not concerning the fowls or pigs.

14,203. At the time of the illness of the child had the inspector of nuisances made any representations as to the fowls or other nuisances?—I could not say that he had.

14,204. Do you happen to remember anything about Mr. Gale, your neighbour's, illness?—That was at another time, I think.

14,205. On October 26th did Mr. Gale have another attack while your child was ill?—I could not say that. I could not remember anything but my child's illness.

14,206. You could not say whether it was true that Mr. Gale had a "gastric attack"?—He had an illness, but I could not say what time it was.

14,207. Did he come to your house or did you go to his house?—No, we did not visit at all.

14,208. Was there any typhoid fever in the house?—Never since I have been in the house; I have had measles with my children when they were very little, but never fever.

14,209. You had watched the progress of vaccination with the other children?—Yes, I nursed them all myself.

14,210. Was there any decided difference between the result of vaccination in this child in the early days after performing the operation as compared with the other children?—Yes; I sent to Dr. Nuttall upon the fifth day after the vaccination to tell him there was a great change in the way of the lymph dropping off the elbow.

14,211. Did the pocks upon the arms rise more quickly?—Yes, wonderfully quicker.

14,212. Is Dr. Nuttall still the Public Vaccinator?—No; he has not been so since my case.

14,213. (*Mr. Meadows White.*) He was at the time?—Yes, he was at the time, and he was my medical doctor; he attended the birth of the child.

14,214. (*Mr. Hutchinson.*) The doctor took lymph from your child's arm, did he not?—Yes, he took lymph from the child upon the sixth day after vaccination.

14,215. So that upon that day, I presume, it was not very much inflamed?—It was so much inflamed that the lymph was unnaturally free in flowing from the wounds. I had to meet him at the board school, and he told me he was not going to use the lymph, that Dr. Tomkins wished him to keep the lymph back that he took from my child's arm.

Emms two days before it died, and I asked him what was the reason of the child's legs and fingers all coming into blisters, and he simply laughed at me and said it was "simply the goodness coming out of the child." That was not a right thing for a doctor to say to a mother. I said, "It is a funny goodness; I shall have to seek better advice." I took it to the Infirmary, where two doctors saw it, who told me that it was a very bad case of blood-poisoning, and that I should take it home at once or it would turn fatal. The child died directly after I got home.

14,223. Do you know what was the certified cause of death?—Dr. Emms gave me a certificate of the cause of death as convulsions.

14,224. Do you know who the doctors were whom you saw at the Infirmary?—I do not know just now, but I could get to know. The child's head was double the size that it ought to be, and after the child's death it was the colour of ink; there was not a joint or part about it which was not completely cracked open. We were not able to wash the child for a fortnight it was so inflamed, every bit of it.

14,225. Do you mean a fortnight before the death?—Yes.

14,226. Had it got at all better?—No, it never got at all better.

14,227. That state of things continued till the child died?—Yes.

\* The date of vaccination should have been given as October instead of June.—K. H.

Mrs.  
F. Wood.  
4 Mar. 1891.

Mrs.  
K. Hart.



*Mrs.  
K. Hart.*

4 Mar. 1891.

14,228. (*Mr. Hutchinson.*) How long did it live after the operation?—Just six weeks.

14,229. (*Mr. Meadows White.*) What was the name of the child?—Annie Hart; the lower part of the child's body was completely skinned all over.

14,230. Annie was the name upon the certificate?—Yes.

14,231. (*Mr. Hutchinson.*) What was the state of the arm which had been vaccinated at the time the child died?—It showed a large black hole; it never became a pock-mark at all; it made a deep hole in the child's arm large enough to hold, they say, a pea; but I say large enough to hold an ordinary-sized Barcelona nut.

14,232. Had the skin covered it?—There was no skin at all; it was a large deep hole constantly running.

14,233. You say its head swelled?—Yes, its head swelled, and it swelled all over its body; its feet in comparison were almost as large as mine.

14,234. Did the doctor call it erysipelas?—He said it was water when I took it to him.

14,235. Have you had other children?—Yes, in perfect health; we have been married 11 years.

14,236. How many children had you had vaccinated before this one?—Two; but I have not had the others done.

14,237. Have those done well?—Yes; but I have not had the others vaccinated. I have had nine children, all in perfect health, and we have never had the doctor in our house for 11 years, excepting for the children.

14,238. Was this some time ago?—No; it was in December 1887.

14,239. To what Infirmary did you take it?—To the Leicester Infirmary, but the child's toe ends and fingers all hung in little blisters which looked like water; but when I took it to the doctor and I asked him, he simply laughed at me and said it was the goodness coming out of it.

14,240. (*Mr. Picton.*) Not being satisfied with that opinion you took it to the Infirmary?—My husband had been out of work through an accident, so I had to have the parish doctor; it was vaccinated by the Vaccination Officer, and I was compelled, by the misfortune of my husband being ill and out of work, to get a paper for the baby.

14,241. Were you working yourself?—Yes.

14,242. Were you compelled to leave your work?—Yes; I should not like to have gone on with my work and see the baby suffering.

14,243. You lost your work?—Yes; and we lost our rest too, as I do not think we could ever go to bed at night and know what an hour's sleep was.

14,244. (*Mr. Meadows White.*) Who was the doctor?—Dr. Emms.

14,245. Is he still practising?—Yes.

14,246. Whereabouts in Leicester?—In Belgrave, Leicester.

14,247. (*Dr. Collins.*) How long did the child live after the vaccination?—Six weeks, but he attended her for five weeks after she had been vaccinated.

14,248. Was the skin red?—It was red, very much inflamed; and when I took it to the doctor and said I

thought it was through vaccination, he only laughed and sneered at me, and never made any statement at all.

14,249. Where did the inflammation begin?—At the arm, and then extended all over the body, so that everything began to crack; its eyes were closed with being swollen so much that we thought it was blind.

14,250. Did it have convulsions?—No, no sign of convulsions, although the doctor signed the certificate "convulsions." When I told the doctor I blamed the vaccination he only laughed at me.

14,251. Have you had any trouble through not having your other children vaccinated since?—No, because I have lived in the town.

14,252. Have you had notices?—Yes, but I took no notice of them. I threw them in the fire.

14,253. (*Mr. Picton.*) Have you had anybody sent down to inquire as to the cause of the death; did anybody come from London?—There were two gentlemen came, but I do not know who they were; there were some gentlemen came to see it after it was dead, and they said they never saw such a sight in their life; but I do not know who they were; I was in very great trouble, and should not want to ask many questions of strange people.

14,254. Do you know whether Dr. Emms made a report upon the subject?—No, I should think not, because being in office under the Public Vaccination Act he wanted to keep it as quiet as he could.

14,255. (*Sir Edwin Galsworthy.*) Is he the Public Vaccinator now?—Yes.

14,256. (*Dr. Collins.*) From what did he vaccinate your child?—He took the matter off a shilling and vaccinated two other children from the same shilling, which two other children were nearly in as bad a case as mine; but they were people who did not seem to care so much about it. In a manner of speaking, some people would as lief get shut of their children as keep them.

14,257. (*Chairman.*) Did they live or die?—They are alive now, but I do not consider it was a proper thing for a medical man to take his glass out of his pocket and empty the matter on to a shilling and then vaccinate my child, and then go and vaccinate other children from it.

14,258. Could you give us the names of the other two children who were vaccinated at the same time?—I cannot; I think they have left the place; poor people move about a great deal.

14,259. (*Dr. Collins.*) Were they vaccinated at the public vaccination station?—Yes, and off the same shilling; I know that, because we had to sit there until the matter dried; he would insist upon it.

14,260. (*Chairman.*) Did you know the names of the other children?—No; I did not take particular notice of them.

14,261. Do you know where they lived?—One lived in Bath Place, I think, facing the vaccination station, and I lived in Thurcaston Road.

14,262-3. (*Dr. Collins.*) Did your doctor make any examination of your child before he vaccinated it?—No, not particularly; the child was in perfect health when I took it.

The witness withdrew.

*Mrs.  
E. Wardle.*

Mrs. EMMA WARDLE examined.

14,264. (*Chairman.*) You are a widow, living at 14, Gosling Street, Leicester?—Yes.

14,265. Your son Thomas was born on the 2nd of December 1874?—Yes, he was.

14,266. He was vaccinated upon February the 15th by Dr. Sloane?—Yes.

14,267. Did he tell you that he had some lymph that he could recommend?—Yes, he did.

14,268. You paid him half-a-crown, I think?—Yes, I did.

14,269. Did the child after that suffer from sores?—Yes, in about three weeks afterwards.

14,270. What sort of sores were they?—Large places used to peel off like the scales of a fish.

14,271. Many of them?—Yes, half-way up his back; a tremendous sight it was for a long time.

14,272. Were they only on his back?—Only on his back.

14,273. How long did they last?—12 months or more.

14,274. Did he afterwards suffer in any other way?—Yes; I took him to Dr. Sloane first, and he said he thought that it was constitutional. I did not feel satisfied with that so we took him to Dr. Cope; Dr.



Cope thought he could do him good; he did his back good, but the disease fell into his knee, and it made him a cripple.

14,275. In what way?—A big swelling on the top of the knee, that continued a long time.

14,276. Which knee was it?—The right one.

14,277. Did he afterwards have anything upon the left leg?—Yes, he had a lump form upon the calf of his left leg; it went on till it broke out into a sore, it was a long time before it broke out.

14,278. How long?—I might say three years or close on to that, then it broke out into a large place; it was eaten away up to his death.

14,279. When did he die?—On the 11th of December.

14,280. In what year?—In 1885. He has been dead now five years this last December.

14,281. How old was he when he died?—About eleven; he was a cripple for over eight years.

14,282. It would be December 1885 when he died; what was the certified cause of death?—Scrofula, so Dr. Williams said.

14,283. Did Dr. Williams attend him?—Dr. Williams attended him for about five years; he was the last doctor, but we took him to many doctors; he was a cripple, he never put his foot to the floor for over seven years.

14,284. Has anyone in your family or did your husband suffer from scrofula so far as you know?—No.

14,285. How many children have you had since?—Five, and they are all well, but I have never had one vaccinated since.

14,286. Your husband has been summoned for non-vaccination, has he not?—Yes, four times.

14,287. (*Professor Michael Foster.*) Had you had children before this one?—No.

14,288. That was the first one?—Yes, that was the first one.

The witness withdrew.

Mr. EDWARD HOLLIS IRONS examined.

14,304. (*Chairman.*) Do you live at 19, Sydney Street, Melton Mowbray?—Yes.

14,305. You formerly believed in vaccination?—Yes.

14,306. And your child Mary Elizabeth was vaccinated?—Yes. Previously to my being married I believed in vaccination, and in consequence had my child Mary Elizabeth vaccinated, along with others in the town. One in particular is in my memory. They were vaccinated privately by Dr. Willan's assistant; my own child and one of the others which I knew, and which I saw every day, had very bad arms. The inflammation on that of mine extended all down the arm and up and over the shoulder, and partly on the chest. I then determined I would never risk another child under the same operation. The other child, belonging to Mr. Thomas Gamble, of Melton, which I saw nearly every day, was as bad as my own, and the corruption extended to the mother, which I should suppose was through nursing it; it extended over her face, breast, and arms. Other cases of injury afterwards came under my notice, one particularly, about twelve months since, which I had occasion to see; that child died from the operation, and the certificate of death I have with me, if the Commission would like to see it.

14,307. What is the name of the child?—William son of William Corbridge, certified cause of death sloughing of vaccine vesicles for three weeks, certified by Dr. G. T. Willan. With respect to prosecutions which I have had to submit to since then: I have six children, the first, as I have stated, was vaccinated, and the other five have not been vaccinated, nor will they ever be. I have been prosecuted in respect of four of my children as follows: I was summoned for a child named John Edward when it was 20 months old, namely, on the 11th September 1883. The summons was under the 29th section of the Act of 1867, and I pointed out to the magistrates that I was improperly summoned, saying that they could not take action against me beyond 12 months after the offence was

14,289. (*Mr. Hutchinson.*) This was your first-born child?—Yes.

14,290. How did the vaccination go on?—He had a fearful arm. I first took him to Dr. Sloane and asked if it was all right. He said, oh yes, it was quite right. The inflammation was quite down to the wrist, and as it got better so it gradually came out on his back.

14,291. How long was the arm in healing?—Rather more than a week. I fancy the inflammation kept it from healing.

14,292. Was it vaccination from a child or from points?—Dr. Sloane said he had got some lymph he could recommend, that was how it was done.

14,293. Did you see the child it was taken from?—No.

14,294. (*Mr. Whitbread.*) Had the child been ill before it was vaccinated?—No; it was a very healthy boy.

14,295. What age was it when it was vaccinated?—Three months.

14,296. (*Dr. Collins.*) You have not lost any children except that one?—No, I have not.

14,297. What went on after you had taken the child back to be inspected upon the eighth day; how did the arm go on after that?—Very badly. It was very bad for a fortnight after Dr. Sloane saw it.

14,298. In what way was it bad?—All swollen up and inflamed.

14,299. Were the pock marks like those on the other children that were vaccinated?—Yes.

14,300. How far did the redness spread upwards?—To the top of his shoulder. We had to poultice it for days.

14,301. Were there any lumps under its arm?—Yes, there were.

14,302. Was there any abscess?—No.

14,303. Were the scars that were left like ordinary vaccination scars?—Yes, they were.

committed, which would be 15 months after the birth of the child. I do not know whether they understood the Act or not, but they overruled my objection, and I was fined 10s. and 9s. 6d. costs. After about six months I was again summoned for the same child, namely, on the 4th March 1884, under the 31st section. An order was made to have the child vaccinated within 14 days, and on the 27th May I was summoned for non-compliance with that order, and fined 15s., including costs. I appealed to the Local Government Board asking them to advise the Melton Board of Guardians not to take any further proceedings against me in accordance with the advice in the Evesham letter. I also appealed to the Melton Guardians calling their attention to the Evesham letter. The Local Government Board in reply stated that as the number of prosecutions recommended in their order had not been taken they could not advise any stay of proceedings. My appeal to the Guardians was more successful, they resolving that as I had been twice prosecuted no further proceedings be taken in regard to that child. Some time after they ordered a summons to be taken out for another child, Tom, also over 15 months old. The summons returnable on the 1st September 1885 was under the 29th section. I once more pointed out the illegality of the prosecutions, and objected to the clerk to the magistrates advising the Bench as he was also clerk to the Guardians, who were the prosecutors. I also objected to one of the magistrates on the ground that he was also a member of the Vaccination committee. These objections were allowed. The solicitor who took the place of the clerk advised that my objection was good and the case was dismissed. Another summons was taken out on 15th September of the same year, and on this occasion the magistrates made an order, or rather previously to their making the order, I stated that I had been advised by my doctor not to have it done and the summons was adjourned on that consideration, to produce the doctor's certificate, which I did on the next session day. Another magistrate presided on that occasion, and not having heard the argu-

*Mrs.*  
*E. Wardle.*

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*Mr.*  
*E. H. Irons.*



Mr.  
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ments adduced the week before, made an order for vaccination in 14 days. The child had scarlet fever, and had I been ever so minded I could not have had it vaccinated. After the time had expired I was summoned for neglecting to comply with the order when another error was made. The magistrate signing the summons was not present to hear the case. I raised an objection, therefore, and was so far successful as to get an adjournment. The next week (on the 16th March 1886) I was fined 5s. and costs. On the 20th December 1887 I was again summoned, on this occasion for two children, the one I had been prosecuted for before and also another one which had got over 15 months. I told the magistrates, the same as I say now, that if they made 40 orders they would not get them obeyed, consequently the order was not carried out. I was prosecuted again on January 17th, 1888, and I was fined 5s. in each case and 17s. 6d. costs. On the 9th February last I was prosecuted again for another child, making in all nine summonses for four children. The order has been made in this case, but it has not been obeyed, and will not be. I have fought the question in Melton Mowbray single handed up to now. I have now some gentlemen on the Board of Guardians who, like myself, are defaulters and consequently in all probability no further prosecutions will take place in Melton Mowbray.

14,308. How long did the inflammation last from which your daughter suffered?—About three weeks; I could not say exactly, but during that time we could get no rest.

14,309. Did it last as long as in the case of Mr. Gamble's child?—I could not state definitely the time, but about as long. I took no note of the time definitely.

14,310. You say the inflammation extended to the mother; can you give it us more definitely than that?—Appearance like a vaccinated arm came out upon the breast and face of the mother, which I took to be contracted through nursing and suckling.

14,311. (*Mr. Hutchinson.*) In the case of William Corbridge, the child which died three weeks after vaccination, was that child vaccinated from the same lymph as your child was?—No, it was vaccinated by the Public Vaccinator of Melton Mowbray, Dr. Roberts.

14,312. And at quite a different time?—Yes, some years subsequently. There are other cases of injury which I have known of without having had time to investigate them clearly, but at the last vaccination by the Public Vaccinator there have been two cases as to which I have had some conversation with the parents, but not to investigate the cases thoroughly. In the case of one the parents had to call another doctor in at midnight, it was dying at the time, but under treatment it is thought possible it may recover now.

14,313. (*Mr. Meadows White.*) Do I understand you to say that you pleaded before the magistrates that your child was ill of scarlet fever, and they replied that they could not take that as an excuse?—Yes, but at the same time I told them that had it not been suffering from scarlet fever it would not have been vaccinated all the same. I did not make it as an excuse.

14,314. I was asking that question for this reason, because it seems so unreasonable in the magistrate that he should not recognise that as an excuse that the child was actually suffering at the time from scarlet fever?—I found that in my case they took very little notice of what you say as regards anything connected with neglect of vaccination.

14,315. (*Chairman.*) But perhaps after they made the order you would have had time to get it vaccinated before it had time to get the scarlet fever?—There was not time; the order was only for 14 days, and you will see they do not give us so very much time. I cannot get at the time now, but they did not give us so very much time; they made the order for 14 days.

14,316. (*Mr. Meadows White.*) Do you mean to say that the child in the 14 days contracted scarlet fever?—Yes.

14,317. And continued ill till after the 14 days suffering from the scarlet fever?—I cannot say the time it suffered, but at that time my own medical man advised me not to have it done, and, as I say, the case was adjourned for the production of the medical certificate, but the other magistrate then presiding took no notice of that because he had not heard the previous argument.

14,318. Was not that on another occasion?—No, on the scarlet-fever occasion.

14,319. This was an adjourned summons, then, not a fresh order?—Not a fresh order, but a summons adjourned to produce the medical certificate, which I produced the next week. Another magistrate presiding at the time did not recognise it; it might have been possibly because I told him I should not have had it done even if it had not been suffering, and that he imposed the fine in consequence.

14,320. (*Mr. Picton.*) I think you told the Commission that you had stood alone in Melton in opposition to vaccination, but you are not so now?—No; in February there were two others, and there are four more now waiting to be prosecuted.

14,321. What has influenced them to resist the law?—Principally, I suppose, the diffusion of literature which I have been instrumental in obtaining, and also I have had the report and the Blue Books of this Commission, which have been already published and submitted to one or two of the Guardians, and I think that the reading of that evidence has, at any rate, possibly influenced them, so that now in all probability they will postpone any further action until the final result of this Commission; that is the intention of the majority of them. The last prosecution was only carried by the casting vote of the chairman.

14,322. (*Dr. Collins.*) Did you in any of your prosecutions for non-compliance with the Act plead that one of your children had suffered from vaccination?—Yes.

14,323. Did you plead that a fatal case had occurred from it?—No, I did not.

14,324. Why not?—Because that was not my case at all; it was only a case which had come under my notice. In the last proceedings I raised a technical objection to the form of proceedings which was overruled; they did not then give me any chance of making a defence at all; they overruled my technical objection and at once stated, "We shall make the order the same as in the other case." I was going to call attention to the fact that they had not allowed me to make any defence, when they said, "Call the next case;" that is the way I was dealt with.

14,325. Did I understand you that the clerk to the Bench is also clerk to the Board of Guardians?—Yes.

14,326. Being therefore clerk to the prosecuting authority?—Yes, I objected to him on that ground, and the solicitor who took his place advised the Bench that my objection was good; it being the same objection as that which their own clerk had previously advised them was bad, and I was fined.

14,327. Has that been the case usually that the clerk to the magistrates is the clerk to the Board of Guardians?—He has been up to now, but he has not advised the magistrates upon any point with which the Guardians are connected since I made this objection. On the last occasion he did not advise the Bench upon any point raised, he called in the aid of another solicitor.

14,328. Has it been the case that members of the Board of Guardians have sat upon the Bench at Melton?—Yes, a member of the Vaccination committee too; I cannot state his name now.

14,329. (*Professor Michael Foster.*) What is the Vaccination committee?—They have a part of the Board of Guardians told off as a Vaccination committee to take cognisance of the cases previous to submitting them to the Board.

14,330. (*Sir William Savory.*) With regard to the child whose certificate you put in; it is not your child?—It is not my child, but it is a case which came under my notice and which influenced me a great deal in coming to my conclusion.

14,331. Upon what ground?—I call that murder, legal murder.

14,332. You believe that only vaccination killed that child?—Yes.

14,333. What does the certificate say was the cause of death?—Sloughing of vaccine vesicles.

14,334. Anything else?—No, with the exception of "bronchitis," and I am informed by the parents that there was no bronchitis at all.

14,335. The certificate says there was?—Certificates say a good many things.

14,336. Did you keep that back because you believed it was not true?—I stated it at the time when I read it out, I think; if I did not it was not an intentional omission.

14,337. (*Dr. Collins.*) You handed in the certificate, I think?—I handed in the certificate; you will see that it



does not say how many days; it says bronchitis—days; it does not say how many days.

14,338. (*Sir Edwin Galsworthy.*) You said that some of the magistrates upon the Vaccination committee sat upon the Bench; did they take any part in the proceedings?—Yes, one did; the Rev. Mr. Laykin did until I objected to him. The leader of the attack against me is a magistrate, an ex-officio Guardian, Mr. E. Frewen; I might perhaps add that this case of Corbridge has been inquired into by the Local Government Board.

The witness withdrew.

Mr. ANTHONY JARROM examined.

14,341. (*Chairman.*) Do you live at 23, Harcourt Street, Leicester?—Yes.

14,342. Your son Edward was born upon the 11th June 1880?—Yes.

14,343. How old was he when he was vaccinated by the Public Vaccinator?—Just turned six months.

14,344. Was he quite healthy at the time?—Yes, perfectly in every respect; he was vaccinated at the Jee Street schoolroom by the Public Vaccinator, Mr. Denton; his arm was bad a long time; we could not get it to heal up.

14,345. Did it discharge anything?—Yes, it continued to discharge.

14,346. What sort of discharge?—Yellow stuff. At last we got some ointment from Mr. Gammage in the town and it healed up after that; it left a little red speck upon the arm, and a little time after that we could see a cancer come in the eye.

14,347. When did that begin?—It would begin a few months after he was vaccinated. I really could not tell you exactly the right time. After the arm got healed up we could see the cancer come in the ball of the eye. I took him to Mr. Hodges and he recommended me to have it out. I did not see it; he advised me to go to Mr. Bell Taylor, at Nottingham, to have his advice. I went three times myself and my wife went once; he took the eye out; there were six weeks between each time. I had to keep going. After he took one eye out in a little while we could see that the child had another cancer in the other; it spread all over his head after that, and this is his photograph about a fortnight before he died, if any honourable member of the Commission wishes to see it; he was a deal worse than that when he died.

14,348. When did he die?—I believe he was two years and five months old when he died.

14,349. The 27th March 1882 is the date I have before me?—I cannot say, but he was two years and five months when he died.

14,350. Do you know what the certified cause of death was?—I am no scholar, but I know the boy was a big sufferer, and was a big trouble and expense to me and his mother too.

14,351. In the certificate I have before me the certified cause of death is given as "Glioma of Retina."

(*Sir James Paget.*) You cannot remember the number of months between the vaccination and the cancer appearing?

(*Witness.*) I cannot.

14,352. You could not say whether it was three months or six months?—I should think it would be something like six months.

14,353. (*Chairman.*) Do you remember how long he had the cancer before he died?—He had it before he was 12 months old.

14,354. (*Dr. Collins.*) And he was six months old when he was vaccinated?—Yes.

14,355. (*Sir James Paget.*) It was about six months after he was vaccinated that you found the cancer in the eye?—Yes.

14,356. (*Chairman.*) Do you know of any cancer in your family?—No, not any; we are all healthy families.

14,357. (*Mr. Hutchinson.*) Is there any cancer in your wife's family?—No, my father's mother and grandmother both lived to be over 100 years, and we cannot trace any cancer in the family back to them, and my mother and father are alive now, and they have no cancer.

14,339. (*Mr. Hutchinson.*) The certificate says, "Sloughing of vaccine vesicles three weeks, bronchitis — days"; do you know how long the child lived after the vaccination?—I believe it was three weeks. It was born April 26th, 1889; vaccinated October 21st, 1889; died November 18th, 1889, just four weeks after vaccination.

14,340. You are not sure of that?—I had the information at the time, but I did not bring it with me.

14,358. Mr. Hodges, I think, saw your child before the vaccination?—Yes.

14,359. Did he lead you to believe at all that the cancer had any connexion with the vaccination?—I do not say that he did, but I have the idea that it was that and nothing else.

14,360. Did any medical man give you that opinion, or at all strengthen you in that belief?—I had him under Mr. Meadows, one of his assistants, and when I named it to him he said he would not like to express an opinion.

14,361. There were six months between the vaccination and the commencement of the cancer?—Yes, but his arm was bad a long time, and we could not get it to heal up at all, and when we had got it to heal it flew to his eye.

14,362. Neither Mr. Hodges nor Mr. Bell Taylor thought there was any connexion between the vaccination and the cancer?—If there were they did not tell me so.

14,363. (*Mr. Whitbread.*) What children have you?—I have five alive.

14,364. How many older than this one?—Three.

14,365. Were they vaccinated?—Yes.

14,366. Did any evil results follow from it in their cases?—No; it so happened we had them done from my own sister's children, but this one was done from the Public Vaccinator's lymph.

14,367. Do you know where the lymph came from with which that child was vaccinated?—No, only from the Public Vaccinator's lymph.

14,368. (*Mr. Meadows White.*) How long a time passed between the healing up of the arm and the appearance in the eye?—I could not tell you justly, but I should say about three months, it might not be quite so much.

14,369. (*Mr. Picton.*) Did Mr. Denton see the child when it was ill with the discharge?—I believe he did see it after it was done; it was taken to him.

14,370. At the time it was discharging matter did he see it?—Yes.

14,371. Did he say anything about it?—No.

14,372. He did not express any opinion?—No.

14,373. Who was it who gave the certificate of death?—I believe it was from the infirmary.

14,374. Was the child at the infirmary when he died?—No, but he was an out-patient.

14,375. And you got the certificate from there?—Yes.

14,376. But you do not know what was stated upon that certificate?—No.

14,377. (*Sir William Savory.*) You did not object to vaccination before this occurred?—No.

14,378. But in consequence of this occurrence you have objected ever since?—Yes.

14,379. Do you know whether the occurrence of this case influenced any of your friends?—Yes, several of them, I believe.

14,380. (*Mr. Meadows White.*) Have you attended any meetings and told this story to any other people?—Yes, I have.

14,381. You have appeared upon what we may call platforms?—No, I have not.

14,382. I thought you said you had spoken at meetings?—I have been in the Waterloo Hall, Mr. Biggs' hall, in Leicester.

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Mr. A. Jarrom. 14,383. Are there meetings held there of anti-vaccinators?—Yes.

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experiences?—Yes. I have spoken to the facts and what I knew about them.

14,385. And others have done so too?—Yes.

The witness withdrew.

Mr. J. Ward.

Mr. JOSEPH WARD examined.

14,386. (*Chairman.*) You live at 54, Clarence Street, Loughborough?—Yes.

14,387. And you are a frame-work knitter, are you not?—No, I used to be; but now I have a license for hawking and travelling for hosiery; framework knitting was my original trade.

14,388. Your son George was vaccinated in 1865, was he not?—Yes.

14,389. Is that your eldest son?—Yes.

14,390. Did he suffer unusually from the vaccination?—He suffered a very great deal.

14,391. In what way?—Before he was vaccinated I may say that the doctor that was attending a brother-in-law of mine, my wife's brother, who had met with an accident, saw the child in the cradle and he said, "Mrs. Ward, I should like to vaccinate that child, for I never saw a finer child in my life." The next time he came he brought some matter with him and vaccinated the child. A very few days afterwards it began to dwindle away as if it was going into consumption. Ultimately I removed to Sheepshed, near Loughborough, and the change of air seemed to bring him round; he seemed almost to recover, but then large liver-coloured lumps formed under the right ear, which grew to the size of an egg or nearly that size. Ultimately it broke and discharged some of the filthiest matter, which, to describe it properly, looked like cow-dung; it seemed to run itself dry and the child seemed to recover. For about three or four years he was suffering pain, and it was unspeakable to see the child twitching from the pain under the right ear; it seemed to recover after the place had discharged and run apparently dry. He has been healthy since that time.

14,392. Is he alive still?—Yes. I was living at Ripley at the time he was vaccinated, and he was vaccinated by Dr. Allen, of Ripley; Nuttall's Park, Ripley, Derbyshire, was my residence at the time.

14,393. Did you have two other children vaccinated?—I was a believer in vaccination at that time. I had two of my children vaccinated in October 1868. My wife was opposed to it, but I insisted. I could trust the doctors, I believed they would do the thing that was right. I insisted upon her having my two children vaccinated, one was named Sarah Ann and the other William. Then about a fortnight after the vaccination they broke out in a complete mass of sores upon the face and neck, and every year, both at the spring and fall, they seem to show the same signs as they did shortly after the vaccination.

14,394. Do you mean down to the present time that they show those symptoms?—The son does, but not the daughter.

14,395. How long did this condition of things go on?—For many years; so great was the son's suffering, and so great the breaking out, that I used to tie his arms down at night with soft flannel to keep him from scratching himself; the child used to come to me before he went to bed to have this handkerchief tied about his hands to prevent him from scratching himself; he was so accustomed to it.

14,396. When did you give up the practice of vaccinating your children?—From the suffering of those two children. I did not believe it was the vaccination at first which had caused the suffering of the first boy. I had no suspicion about its being vaccination, in fact, as I said before, I insisted upon Mrs. Ward taking those two children and having them vaccinated.

14,397. Did you have any others vaccinated except those three?—I had one more vaccinated.

14,398. When was that?—That was after those two.

14,399. When was that?—She was vaccinated in 1872, but against my will. I have been prosecuted for that one. I was opposed to vaccination because of its having produced that suffering in the two I had insisted upon being vaccinated, and from that time I have been an opponent of vaccination. On the 10th of January

1872 I was summoned to the police court for non-compliance with the vaccination order. I was fined 2s. 6d. and 11s. costs. Mr. Hussey Packe, being in the chair on the Bench, told me, when I was defending myself, that if I did not hold my tongue he should commit me for contempt of court. The vaccination seasons were April and October, and I wish you to take particular notice of this, that October and April were the vaccination months of the year. Now on the 10th of January I was fined; on the 20th of February I had to appear again with the child according to the summons, but having to walk five miles from Sheepshed to Loughborough, I did not take the child as I was not very well with the harassment. The doctor was there to examine the child, and they adjourned the case for a fortnight because the child was not there. The Bench days were every fortnight then. The next fortnight I took the child and the doctor was not there. I admitted it was not vaccinated, but they adjourned the case, for what reason they did not tell me. I appeared again the next fortnight, and why they adjourned it again I know not, but it was adjourned again. Never an order was made out any of these times for the child to be vaccinated. In the first case on the 10th of January I was fined without the order being made. I had to appear again on the 3rd of April, which was the fifth time for the same child, and then I was fined 1l. and 1l. 6s. costs, or 14 days' hard labour. Mr. Charles Shakespear, of Langley Priory, was the presiding officer at the time, but some one being in court, who I did not know was there, paid the money and said he should not allow me to go to gaol. I was threatened after this with further prosecution for the same child, and Mrs. Ward, being overcome by anxiety and wanting to keep me out of gaol, went and had this child Nellie vaccinated without my knowledge or consent.

14,400. That was in 1872, was it?—Yes, in 1872.

14,401. Did the child suffer unusually from the vaccination?—I did not notice so much suffering from this child as I had from the others.

14,402. (*Professor Michael Foster.*) Did it suffer at all?—Upon the eighth day (I did not know that it was vaccinated till the eighth day) I noticed it lying in the cradle and looking very ill indeed and I was suspicious that there was something wrong, and for curiosity's sake I turned the child's clothes to see, and I found that it had been vaccinated; I did not know that it had been vaccinated till the eighth day.

14,403. (*Chairman.*) In that case the vaccination ran its usual course, did it?—It seemed to. In 1877 on the 4th of April I was sent to the Leicester county gaol for not submitting Luther Ward to the operation. I was sent to gaol without an order being made by the magistrate for vaccination. I simply mention you this to show you how the law has been administered; the magistrates have overridden the law and dealt very cruelly with the objectors. Mr. Charles Shakespear, of Langley Priory, was the presiding magistrate on this occasion too; he was sending me down for hard labour, but the clerk told him that he could not send me for hard labour, so I had seven days in gaol, and I wish to impress this upon your minds that I did eight days. They kept me in the cells at Loughborough for one day, and then they sent me to Leicester for seven days more, so that I had eight days in gaol instead of seven. On February 17th, 1886, I had to appear before the magistrates again for the non-vaccination of another child named Jessie. An order was made for its vaccination within 14 days, and of course I conscientiously objected to the law, believing it to be a great evil to the children, and I did not have it vaccinated. On the 12th of May I had to appear for non-compliance with the order of the magistrates. I was then fined 10s. including costs, or five days in gaol. I was allowed to leave the court and was at large till the 21st of September the same year, when I was fetched from the breakfast-table and taken to Leicester gaol again, and some friend hearing of my having gone to gaol went and paid the money, so that this time my stay in gaol was a short one. I had the



prison dress on, it is true; I had the prison bath and I had the prison dinner, then my clothes were brought to me and I was told to put them on, and I was sent home again. I did not know who had paid the money, and I have never been told from that day to this; it was none of my own relations, I know. I have 11 children in all, four have been vaccinated and seven are unvaccinated, and the seven which are unvaccinated are far more healthy in every respect, and every one of you gentlemen would say so if you were to see them, than the others who have been vaccinated.

14,404. The one vaccinated, was that a boy or a girl?  
—A girl.

14,405. Is she unwell?—She very often is unwell.

14,406. In what way?—It does not break out as it did in the other two, but her general health seems not like that of those who have not been vaccinated; they are more robust; they seem to enjoy life better in every respect. It is not because I wish to break any law of the land. I have never been in a magistrate's court upon any occasion whatever, only for trying to protect my children from vaccination, which I believe to be an evil.

14,407. (*Mr. Meadows White.*) In the case in which there were three adjournments, that was because you did not bring the child with you according to the order?—The first occasion I was summoned to take the child with me, to appear in Court with the child—I did not take the child, the doctor was there—I admitted it was not vaccinated, and I asked them what they wished me to take it for, and they told me to prove that it was not vaccinated; they had the doctor there on purpose. I said I admitted it was not vaccinated.

14,408. They adjourned the case?—They adjourned the case for me to take the child the next fortnight.

14,409. Did you take the child the next fortnight?—I took the child, but the doctor was not there that time, and they adjourned the case again; they did not tell me why, and I came to the conclusion that it was simply to run it on into the vaccination month of April before they concluded the sentence and fined me.

14,410. (*Chairman.*) What do you mean by the vaccination months?—The months of April and October.

14,411. That is when the Public Vaccinator attends?—When they have to attend the Public Vaccinator for the children to be vaccinated; the registration certificate specifies the place where the vaccination is provided and when they must be vaccinated. That is why I called attention to the fact of my being fined upon the 10th of January, and to the fact of my being summoned to appear three times in court before the vaccination month came on, and then when they got into the vaccination months they decided the question.

14,412. (*Mr. Whitbread.*) What distance had you to go to the court?—It is five miles from where I lived.

The witness withdrew.

Mr. JOHN THOMAS BIGGS further examined.

14,426. (*Chairman.*) I believe you wish to refer to one or two matters which were left open upon the last occasion?—Yes; there was a question raised in reference to a resolution which was moved by a member of the Board of Guardians in 1870 which I should like to refer to first. The official record states that there were 18 votes cast against the resolution and none for. I have referred to the newspaper report, and I find that Mr. Taylor, who moved the resolution, did, according to the newspaper report, vote for it, but that his was the only vote, and that the seconder seconded the resolution simply for the purpose of allowing the debate to be carried on.

Then, in reference to life assurance, there was a question put by Mr. Meadows White, who wanted to know if I had an adult proposal form from the Prudential which corresponded with the medical referee's report. I have obtained one with a number of other forms from the company, and I find no reference to vaccination in any of them. There was another question in reference to this which I will just reply to now. A question was asked by Professor Michael Foster at what age infants were insured. I understand it is one month after birth.

Then in regard to notification of erysipelas, I thought I would make further inquiries respecting it. Your Lordship referred to some matters which were contained

14,413. So you had to lose your day's work?—I had to lose four days' work and to take my child on one occasion and to lose my time, and thus to deprive my family of the necessaries of life.

14,414. Were there any anti-vaccinators in the district where you lived?—No, I was single-handed, but some sympathized.

14,415. Are there any now?—I do not know; I was living at Sheepshed then. I am living at Loughborough now. I have been there eight years come May.

14,416. Did you take any steps to draw attention to what you considered the wrong practice of the magistrates not making orders?—Being only a working man, I had not the power. I will tell you what the magistrates did upon the last occasion. I had the Vaccination Act with me and I read out the clause. The magistrate said: "Let me look at it." The Act specifies that during 12 months only shall any proceeding be taken against any opponent of the Vaccination Act from the time when the matter of complaint arises; the matter of complaint arises when the child is three months old; my child was 16 months old when they sent me to gaol, and they gave me the offer of appealing against their decision, but I went to gaol; the appeal was only a mockery because I had not the money to appeal with.

14,417. (*Mr. Picton.*) What do you reckon you lost in money by attending at the court five times; what would a day's wages be at that time?—Trade was very good at that time; I could not get so much in the stocking frame now as I could then.

14,418. What could you get then?—I could get 4s.

14,419. So that each time you lost a day's wages?—Yes.

14,420. Making 16s., which would have to be added to the fine and costs?—Yes.

14,421. Have you ever observed amongst your friends and relatives any instance of failure of vaccination to protect from small-pox?—My wife's brother named William was vaccinated when a child, and he died from small-pox when 27 years of age in Woodgate, Loughborough.

14,422. In what year was that?—In 1872.

14,423. There was an epidemic of small-pox at that time?—Yes.

14,424. Did many others die of it?—I do not know of many. I was living in Sheepshed at the time, but he lived at Loughborough, and died at the top end of Woodgate, having been vaccinated when a child.

14,425. (*Mr. Hutchinson.*) Had he been vaccinated more than once?—No, he had not been re-vaccinated.

in the Medical Officer's report, and I raised the matter at the sanitary committee last Friday.

14,427. You stated yourself that the question of diseases and their connexion with vaccination should be left over till you came to deal with the vital statistics generally?—I did say so, but with regard to erysipelas I do not know that we shall have anything further to say upon that subject.

14,428. You do not deal with that in your vital statistics?—No; I have here the last four quarterly reports of the sanitary committee which have been presented to the Council. It was a question of how many were struck out of the notifications of infectious diseases, and I find that in the report for the quarter ending the 25th of March 1890, out of 183 notifications 14 were struck out by their order, or by the Medical Officer.

14,429. Under what authority were they struck out?—I have examined the books, and I find that they are struck out by the Medical Officer on several grounds. Some of them are cases just beyond the borough boundary, and are struck out upon that ground; others are struck out because a previous notification has been received from the same house within one month, and unless 30 days elapse before another notice is sent they are not entertained at all; others are struck out upon other grounds, for instance, because on investigation

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they are found to be of such a trivial character, mere scratches or gum boils, that they are not entertained upon that ground.

14,430. But what power is there to refuse to pay the fee because it is what you call a "trivial case" of infectious disease? I thought the statute provided that they were bound to notify every case of infectious disease, and were subject to a penalty if they did not, and were entitled to a fee if they did. What authority have the sanitary authority to say, "Because this is only a slight case you shall not have your fee"?—I do not think they have any authority, but if the medical man feels at all aggrieved he has his remedy in an action in the county court, I presume.

14,431. Do you suggest that those were not cases of disease at all, or merely that they were slight cases?—Some of those struck out were, I am informed, very slight cases, and some of them turned out not to be the supposed disease at all.

14,432. Of course where it is not an infectious disease it is not notifiable under the statute, and the medical man is not entitled to a fee for the certificate?—No.

14,433. Of what nature were the cases struck out?—In that one quarter there were 12 cases of scarlet-fever, one of typhoid, and one of diphtheria, but none of erysipelas.

14,434. Surely however trivial either of those cases was, if it was either typhoid, scarlet fever, or diphtheria, it was properly notified; might not either of those cases have been the cause of the spread of the disease to others?—No doubt it might if it had been the disease, but I think all those struck out were found on inquiry not to be suffering from those diseases. About three months ago the Medical Officer notified a report that he had received of small-pox, and on investigation he found that the patient was not suffering from small-pox, and I remember his making the remark that the medical man had never seen a case of small-pox, and therefore did not know it. I do not remember what the case proved to be, but I may say that I do not think the sanitary committee would hesitate to pay any number of fees; their anxiety is to keep the town free from disease, and I am quite sure they would not shrink from any expenditure in that direction, but it is found that a very large number of cases are notified, and apparently notified, as was indicated last week, for the sake of securing the fees. Then we had a report presented on the 6th January this year, and I find that out of 266 cases notified 29 were struck out, 15 cases of scarlet fever, 3 of erysipelas, 10 typhoid, and 1 diphtheria.

14,435. Those probably were, several of them, cases where the notification related to premises outside the boundary of the borough?—In all probability it would be so in regard to all the quarters I have alluded to. The borough authorities at the present time are promoting a Bill for the extension of the borough to the outlying districts which are immediately contiguous to the borough. It sometimes happens that in a street the medical man does not always know whether the house he is visiting is actually within the boundary or without; that is a matter for the Medical Officer to look after. Then again, I stated that I believed the sanitary inspector on receiving the notification communicated with the Medical Officer of Health who visited the cases. I put that question at the sanitary committee, last week, because the question was addressed to me as to whether 24 hours might not elapse before the Medical Officer visited the case, and that if it was a case of erysipelas it might, in the meantime, have partly recovered. I find that the sanitary inspector first visits the whole of these cases, and if there are any of a serious character the Medical Officer visits them afterwards. I asked the Medical Officer if it was possible for 24 hours to elapse between notification and a visit either upon his part or upon the part of the sanitary inspector. He said it was not, that every notification that was received before mid-day would be inspected the same day, and that every notification received in the afternoon of the day would be inspected not later than the following morning, excepting very few cases.

14,436. I suppose this sanitary inspector is not a medical man?—No.

14,437. So that he would not be in a position to judge whether it was or was not an infectious disease?—An arrangement has now been made by which the chief sanitary inspector visits the whole of the so-called infectious cases; and, in my belief, from having had

such a wide experience, he is almost equal in his judgment to a great number of medical men themselves.

14,438. (Mr. Whitbread.) Before leaving the subject of erysipelas I should like to draw your attention to a question which I asked you last time, Question 13,861. You were asked: "Have you any table to show that there is a difference in the proportion of children attacked by erysipelas who have been vaccinated, as compared with those who have not been vaccinated." I understood that you would ask whether such information could be obtained from these statistics which you had in the town?—I have no further information upon that point. I think the answer I gave was that it would be almost impossible to ascertain this now any further than we can glean the information from the Medical Officer of Health's reports. There is a reference to erysipelas at page 18 of the report for 1889, in which the Medical Officer refers to 219 cases which were notified, "not one-tenth of which" he says "were of sufficient importance to have any significance from a public health point of view. Five deaths resulted, and in most of these other and more severe disease co-existed." And he goes on to say: "That Erysipelas should have been included in the new Notification Act passed by the Government is a matter of surprise to your Medical Officer, especially after the evidence which was submitted from Leicester upon this subject to the President of the Local Government Board."

14,439. But surely the data upon which the Medical Officer's report was drawn up, are, in all probability still in existence, are they not?—No doubt they are; they would be in existence in his reports, and the registers of births, vaccinations and deaths.

14,440. You see the importance of the question?—I do.

14,441. If you show that the larger proportion of children suffered from erysipelas amongst those who have been vaccinated as compared with those who have not been vaccinated, so far as the statistical argument goes it would have some importance. On the contrary, if it appeared that the children who were not vaccinated suffered more than the children who had been vaccinated it would tell the other way?—Yes; but in regard to erysipelas all that we could do would be to show whether the fatality from the disease had increased or decreased at any given time; and it would be almost impossible to ascertain, I think, at the present time whether the deaths of children from erysipelas were the deaths of children vaccinated or unvaccinated.

14,442. But you have the names of all those children registered, and you can tell whether they are vaccinated or not?—Yes, we have that.

14,443. And you have the deaths from erysipelas; you could get them?—Yes; it would involve enormous labour to search them out.

14,444. Is it possible to get at it?—I doubt whether it is accurately, but I will look into the matter.

14,445. (Mr. Meadows White.) How many children were vaccinated during the period over which the 266 cases that are referred to in that report extended?—That period would be three months; there would be about 25 to 30.

14,446. They would not be 266 cases of erysipelas, would they?—No, they would be 266 cases of notified infectious diseases; but there are out of that number 58 cases of erysipelas and about 25 children vaccinated out of about 1,200 births.

14,447. (Chairman.) Would not some light be thrown upon the matter by a comparison of this sort. Take the last three or four years, when there have been hardly any cases of vaccination, comparatively speaking, in Leicester. A few years before that there were a very large number every year—2,000 or 3,000—as compared with now a couple of hundred. Now if vaccination were largely the cause of erysipelas, ought you not with that strong contrast between the number of vaccinations to have found some distinct manifest impression upon the erysipelas cases?—I think possibly we should, and from that point of view the investigation could be made and a comparison drawn.

14,448. But you have not made it?—No, I have not, because erysipelas is not regarded as one of the principal zymotic diseases, and it did not appear to be necessary to deal with any other than the principal zymotic diseases; the deaths from erysipelas are very few comparatively.



14,449. You must be aware that deaths from erysipelas are largely attributed to vaccination?—That is so. I will look up whatever information I can upon the point.

14,450. (*Dr. Collins.*) You will probably admit that there are many other causes of erysipelas besides vaccination, if that be one?—Yes, no doubt of that.

14,451. (*Sir William Savory.*) They would remain stationary, would they not?—Not necessarily so.

14,452. (*Chairman.*) Does that conclude what you wished to add to your previous evidence?—There is one other quotation from the Medical Officer's report, page 97, of 1889, which I should like to read. He says in respect to erysipelas: "Five deaths only were registered as due to Erysipelas, out of the 219 cases which were notified to the Health Department. This fact alone is sufficient commentary on the trivial character of a large number of these so-called cases of Erysipelas. Whenever opportunity occurs, this disease should be removed from the list of those to be notified, being unnecessary expense, with but little or no benefit accruing therefrom."

14,453. What is the next point to which you wish to direct the attention of the Commission?—I want now to make one or two references to the question of diarrhoea which was raised. Some questions were addressed to me respecting diarrhoea, and although I propose to deal with that more fully hereafter, I think it would be advantageous to allude to it at the present juncture. In Professor Crookshank's "History and Pathology of Vaccination," volume II., pages 404 and 405, from "Observations on the Variolæ Vaccinæ" by Robert Ceely in 1840, these words occur: "In using primary lymph and its early removes, however we may be disposed to attribute to it the power of aggravating the constitutional symptoms in certain temperaments well known to be obnoxious to them, yet we are also forcibly reminded that the very same lymph will appear to produce scarcely any appreciable symptom in others. Roseola, lichen, &c., with vomiting, diarrhoea, delirium, &c., arise in some, while in others mere acceleration of pulse is observed without complaint." Then we also have a statement upon that question by Dr. Ballard, in his prize essay on vaccination, which was published in 1868. At page 90 he refers to the opinion of Bousquet, who "held that the cutaneous excitation was apt to show itself in the form of erysipelas or roseola, &c., and in infants very young indeed that the intestines sympathised, and that enteritis or diarrhoea might result." I also find a reference to this subject in a quotation from the observations of Dr. Monteith, of the Newcastle Dispensary. This is published in Mr. White's "Story of a Great Delusion." At pages 429 and 430 Dr. Monteith says this: "The mortality from Diarrhoea is unfortunately steadily increasing the percentage for the last five years, 1872-77, being the highest on record, viz., 14.4. The majority of the deaths take place among infants, and the disease is produced in most cases by the ignorance or carelessness of mothers in giving them food which is not fit for them. But why this should be the case now any more than it was 20 or 50 years ago I cannot understand. An increased consumption of alcoholic stimulants in later times has been suggested to me as an explanation." I find those references bearing upon that particular subject. Then I wish to supplement this by an observation made by our Medical Officer of Health in this report from which I have already quoted. Your Lordship referred to the number of deaths from diarrhoea as being higher for one particular year than for the 10 preceding years. The Medical Officer in his report for 1889 drew up a retrospect of the last 30 years, and these are his observations, at page 54, respecting diarrhoea: "The returns of Diarrhoeal mortality, when compared the one decade with the other, also afford ground for hope that the Borough may be improving its condition even as regards this disease. Thus, in the first 10 years the average annual mortality was 186, in the second decade it was 246, whilst during the last period, when the population has become much greater, the average annual number is 235 only." There are no rates given with these figures, but the figures themselves show a decline considering the enormous increase of population; there is no doubt the decline itself is considerable.

I should like to refer also to one or two questions that were put to me by Sir William Savory. I feel that I must refer to this matter again. In a question addressed

to me by Mr. Pieton an extract was read from a lecture or an address given by Dr. May of Birmingham; the first part of the quotation was not read on that occasion, and I should like to read it now. Dr. May says in the preceding passage: "In certificates given by us voluntarily, and to which the public have access, it is scarcely to be expected that a medical man will give opinions which may tell against or reflect upon himself in any way, or which are likely to cause annoyance or injury to the survivors. In such cases he will most likely tell the truth, but not the whole truth, and assign some prominent symptom of the disease as the cause of death." That is from the third volume of the Birmingham Medical Review, page 34. Dr. May was Medical Officer of Health for the Aston Union; it was a paper read before the Aston Medical Society in 1873.

14,454. (*Sir William Savory.*) He is speaking for himself, of course?—He is speaking for himself, no doubt, but it is a paper published by a medical man in a medical journal, and I do not know that the statement has ever been contradicted or denied or met in any way.

14,455. It was probably not thought worth while to contradict it?—As bearing upon this particular subject I should like to read a reference to a recent matter which has occurred in Birmingham, some reference to which is made in the "Lancet" of February 14th of this year, where this paragraph occurs: it is headed "Vaccination and professional courtesy." "Dr. Edmund Robinson, the Public Vaccinator for Birmingham, sends us details of two cases which involve grave want of professional courtesy. A year ago he vaccinated a child, and not long afterwards he accidentally heard that an inquest was to be held on the child, because its death had been certified by another medical practitioner as due to syphilis from vaccination. The result was a verdict showing that the certificate had no foundation. Again, Dr. Robinson this month finds a report in a local paper as to a child whom he vaccinated some time back, and which, having been under the care of another medical practitioner, is alleged to have died of erysipelas associated with vaccination. The cause of death may, for all we know, be correct in this instance, and it is not this to which we desire to draw attention. But we feel very strongly that when a medical practitioner is called in to attend a child, in connexion with its vaccination which was performed by another practitioner, his obvious duty is to place himself at once in communication with his *confrère* who performed the operation, and it will be clear that no breach of ordinary professional courtesy such as is here indicated can possibly be justified because the case was one of vaccination instead of any other operation, or because the medical practitioner who performed it happened to hold a public office. It may be some satisfaction to Dr. Robinson to know that all such cases as he refers to are being inquired into by the Medical Department of the Local Government Board."

14,456. I do not quite see how that bears upon your point?—The bearing upon this particular point is this: in many instances in my own knowledge I have heard of children who have been injured according to the parents' statement by vaccination, and when I have addressed the question to them as to whether when the injury became apparent they took the child to the medical man who had performed the operation, they have often said, no, they have taken it to another medical man; and frequently I have noticed the statements of medical men where they have said that they had vaccinated a large number of children, but had never known evil results to follow. I think this largely occurs through the parents of the children placing them under the treatment of another medical man instead of the one who performed the operation, and when we regard that in conjunction with the statement which is made here in regard to this question of professional courtesy, it seems to me to have a very strong bearing; because I do not know what that article is published in the "Lancet" for, unless it is to impress upon medical men the desirability of having some consultation together before coming to any decision in regard to a case which is placed under their care.

14,457. But supposing they do, what objection is there to their consultation?—No objection whatever; but where the patient is placed under the care of a medical man, and a case of death occurs, and he gives a certificate, I suppose the presumption is that he

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would give a certificate according to his own judgment entirely unbiassed by that of the medical friend he might consult. I am not indicating or wishing to indicate by that answer that medical men would be largely biassed, but still we find that this consultation is insisted upon in very high quarters, and there is no doubt that to a very large extent it is carried out.

14,458. Unless that suggestion is made I cannot see what the force of the objection to the consultation is. If you suggest that by the consultation one man may be persuaded out of his opinion by another I can understand that, but unless that is the case I cannot see what is the objection to consultation?—I do not raise any objection to it.

14,459. Then what was the object of quoting that passage from the "Lancet"?—My object in quoting that passage from the "Lancet" was to show that among the medical profession there is a certain *esprit de corps* which does possibly influence their decisions to a certain extent. I do not know to what extent, but to some extent most certainly.

14,460. Then you do suggest that their decisions are influenced in that way?—I believe that their decisions are influenced in that way sometimes.

14,461. Do you propose to bring forward any facts to substantiate that statement?—I propose to do so presently.

14,462. Will you bring it forward now as we are discussing this point?—I will do so. I have before me an account of two cases of death which occurred at Hinckley, near Leicester, and I should like to read the statements of the parents to the Commission. These are the two cases named by Mr. Hackett last week, and he wished me to mention them. One is a copy of a certificate of death from vaccination.

14,463. What is this to show?—These are two cases of children which died as the result of vaccination; and, in the first case, the death of the child was certified as arising from the following causes: "Vaccination, erysipelatos inflammation, acute bronchitis, exhaustion." The other child that died a week afterwards was vaccinated by the same medical practitioner, and on that certificate, the parent informs me, "Marasmus and exhaustion" only were entered in the first instance. Some complaint was made by the parent, and there was a remonstrance with the medical man.

14,464. With the medical man who vaccinated the child?—With the medical man who vaccinated the child, and he did eventually enter, according to information I received yesterday, "Erysipelatos inflammation" in the certificate in addition to "marasmus and exhaustion."

14,465. Was there any consultation in that case?—I was just going to refer to that. Between the death of the first child and the death of the second child a meeting was held in this small town. After the death of the second child someone went down to Hinckley from London, and a consultation was held as to the effect of the lymph which was used in this particular instance. I do not know who went down, but in the meantime, in the second instance, in consequence possibly of a public meeting or something which occurred a certificate was given omitting vaccination.

14,466. But there has been no "consultation" hitherto; you say "in consequence of the consultation," what consultation?—A consultation with the gentleman who went down from London.

14,467. Did he consult with the doctor who vaccinated the child?—He consulted with the doctor who vaccinated the child.

14,468. Who also vaccinated the first child? Who vaccinated both the children?—I am proposing to read the statement of the parents. This is the statement in the first case: "On March 31st 1889 we had a child born (girl). From the time of its birth until after it was vaccinated, viz., July 15th, the child was quite well, healthy, and strong. The operation was, at our request, performed by Dr. — of Hinckley, to whom we paid 2s. 6d. fee, in order to have good lymph and a practised operator, as we were led to believe he was. He informed the mother and grandmother that the matter with which he vaccinated our child was 'calf' matter. On the Wednesday after the insertion of this pure 'calf lymph' in the infant's arm it became much inflamed right down to the elbow, and 'blebs' appeared under the same. It proceeded to get worse day by day until the

following Monday, on which day it was again taken to the doctor for inspection. The mother asked the vaccinator how he accounted for the greatly inflamed state of the arm, and he replied that he was certain the 'lymph was pure,' but any other reason for the terrible results which have followed this very 'pure' lymph was not forthcoming save excuses. He advised poultices and lotion, and we applied them for a week, strictly as advised, but our efforts and the doctor's were of no avail, for the infant, after much suffering, succumbed to the effects of the fatal operation on Monday the 29th of the same month (July). As above stated, until we permitted the vaccinator to place in the child's arm the 'pure calf lymph' it was healthy, happy, and well, and we much regret we did not let well alone and decline to have the babe interfered with. Neither of us has been troubled with any blood disease, nor has any person connected with us, and we are quite positive, as the certificate of death states, that our infant daughter died from the effects of vaccination." The other statement is this: "On May 10th 1889 we had a child born (girl) at 26, Waterloo Square, Hinckley. Until June 13th 1889, the child continued to thrive and get on well, and up to this time it had suffered no ailment. Knowing that it was required by law that it should undergo the operation of vaccination, and not expecting any injury would follow in case the matter was good, and knowing that Dr. — of Hinckley, had a repute for skilful vaccination, we decided that he should be asked to vaccinate the infant. Agreeably with this view the mother took the babe to Dr. —, and he vaccinated it, as he said, with 'calf lymph,' adding that he knew it was really good lymph, and that it was quite fresh. We paid him 2s. 6d. as his fee. One puncture only was made and that was on the left arm. A week after vaccination, viz., on the following Saturday, as nothing of importance seemed to have occurred to the vaccinated arm, the child was taken a second time to Dr. —, when it was again operated upon, this time by Dr. —'s assistant. On the following Monday inflammation set in all around the puncture, gradually extending all over its body, and after much suffering and causing us much trouble and anxiety, the doctor being unable to rectify the mischief—and we believe he tried the utmost—the infant succumbed on Saturday, August 10, 1889. Neither of us has ever had any blood disease, and so far as our knowledge goes no one in either of our families has. Both of us are quite certain in our own minds that vaccination is the cause of death, and no certificate of death certifying to the contrary will alter our belief. Some of our neighbours can fully corroborate the facts here recorded."

14,469. But how can that bear upon the relation which a consultation holds to a certificate given of death; the suggestion is that by a consultation one man may persuade another to give a different certificate from that which he would deem to be correct, how does that extract bear upon the fact?—I do not think the manner in which the question is put does state exactly the facts of the case. The statement I read from Dr. May appears to be borne out by the statement which I have now laid before the Commission, that in all probability the medical man would give some part of the truth. "In such cases he will most likely tell the truth, but not the whole truth."

14,470. But not through consultation?—Not in consultation, but in the certificate of death.

14,471. But surely we are discussing two distinct things; one is the suggestion that a man may give a certificate of the cause of death other than the right cause to shelter himself, and the other is that by two men consulting together one may persuade the other to alter his certificate from that which he deems right; that being the objection taken to the consultation. The "Lancet" suggests that a consultation might be held between two men before the second man gives a certificate of the cause of death from vaccination which had been performed by the first. I ask what objection there is to that consultation?—I say no objection at all; but at the same time a doubt arises in one's mind as to why the suggestion is made; why a medical man is not deemed to be absolutely competent to give either a certificate or his opinion without consultation on the subject.

14,472. But cannot you see that if a patient is suffering from an operation performed by one medical man, and another man is called in to express an opinion



upon the case, he might gain some help from hearing what the man who performed the operation said?—Yes, no doubt he might.

14,473. That is the reason for having the consultation?—No doubt that is the reason.

14,474. And a good reason?—Yes, but probably not the only reason.

14,475. Is there any objection?—I have already said that I do not know of any objection.

14,476. Then if there is no objection, for what reason do you bring forward that passage from the "Lancet"?—I bring forward that passage from the "Lancet" because it was written in regard to the case of a child who had died through vaccination in Birmingham; and why such an article should be written, and the suggestion made particularly in regard to vaccination any more than in regard to anything else, I am really at a loss to understand.

14,477. It is not in regard to vaccination more than in regard to anything else, but it is in regard to any case in which death is supposed to follow upon an operation performed by one man; the "Lancet" suggests that before another man should certify to that as

being the cause of death he should put himself into communication with the first?—Yes.

14,478. What possible objection can there be to that?—No objection whatever; but it appears rather suggestive that an article should appear in the "Lancet" in reference to a case in which the death is alleged to have arisen from vaccination when one would have thought that the principle embodied in this article would have been so thoroughly recognised by the profession that there was no need really to impress it further upon their minds.

14,479. Now I will ask you one more question. Can you produce any fact to show that under such circumstances one medical man has persuaded another medical man to give a certificate of the cause of death other than that which he believes to be the correct one?—I am afraid that would be impossible for anyone to say, because, as I stated on the last occasion, it is impossible to know what would influence the mind of a medical man.

14,480. (*Dr. Collins.*) If I understand the "Lancet" quotation correctly, the paragraph does not state that the gentleman called in had found any difficulty in arriving at the cause of death?—No doubt that was so.

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Adjourned till Wednesday next at 1 o'clock.

## Fifty-ninth Day.

Wednesday, 11th March 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMET PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary.*

Mr. ALFRED WILSON EMMS, M.R.C.S., examined.

14,481. (*Chairman.*) You are a medical man practising at Leicester?—I am, and I am also a Justice of the Peace for the county of Leicester.

14,482. I believe you are one of the Public Vaccinators?—Yes, for the Belgrave district of the Barrow-on-Soar Union.

14,483. You vaccinated in June 1887 the daughter of Mrs. Hart, did you not?—Yes, but I should like before answering any questions just to remark that I did not get the Secretary's notice until this morning, and I have come totally unprepared in any form or shape, except what my memory will take me back to; so that I cannot be particular as to dates; it is four or five years ago. I had thought the whole thing had dropped through long enough ago.

14,484. You were up in town for another purpose altogether?—Yes, I came up to give evidence before a Committee of the House of Commons, but I should be glad, if I were permitted, as a matter of personal convenience to give my evidence to-day.

14,485. Do you remember whether the child was healthy at the time of its vaccination?—As far as I am able to judge it was a fairly healthy child; I should not call it a particularly strong child.

14,486. It has been stated that after she had been vaccinated three days she began to be ill, and that "about seven days after she began to swell in every joint that she had—her arms, knees, fingers, every joint in the child's body"?—It is untrue. Fortunately prior to the child's death, that is to say, within two or three days, the woman took the child to the infirmary; she was there seen by Dr. Neale, who is one of the physicians

at the Infirmary, and the anti-vaccinators of Leicester reported in the public papers as to this child that Dr. Neale at the Infirmary had said that the child was suffering from blood poisoning. He immediately contradicted that report, and Mr. Leavesley and Mr. Biggs, who brought this case here, both know perfectly well that he contradicted it.

14,487. It is stated by the mother that three places were made upon the child's arm, two of which did not take at all, and the one that did take went to a large black hole large enough to drop a pea in?—It is absurd; the vaccination had nothing whatever to do with the child's death; that you may take my word for.

14,488. Did anybody see the child in the Infirmary besides Dr. Neale?—At that time I did not know Dr. Neale personally; I believe they did.

14,489. Attention was called at the time to the case, so that the doctors who examined it there would have examined it in view of the fact that it was alleged to have suffered from vaccination?—That is so, and Dr. Neale absolutely denied in the public press that he ever said so.

14,490. (*Mr. Meadows White.*) He is a medical man, is he not?—Yes, he is a medical man.

14,491. Practising in Leicester?—Yes, practising in Leicester; he is one of the physicians to the Infirmary. (*See Questions 14,824-920.*)

14,492. (*Chairman.*) It is stated that you said when the child was under your care that "it was 'water' on account of its eyes being swollen up so much"?—The whole of the statements which are made as coming from

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me are untrue. I never said anything of the sort, and when the woman came to my surgery for a certificate I said to her, "I am very sorry that you, without coming to see me, should have made all these statements;" and the woman began crying.

14,493. What statements do you refer to?—Those statements about the vaccination; there were several others. It seems that somebody had gone down to Leicester and had got these people to sign a statement; whether it was read over or not I cannot say, but she cried in my surgery and said she was very sorry it was ever done.

14,494. I must put it to you—she says that when she asked you what was the reason of the child's legs and fingers all coming into blisters, you simply laughed at her and said it was "simply the goodness coming out of the child"?—You must take that for what it is worth.

14,495. Is it the case?—It is absolutely untrue; I deny it most emphatically; I am not in the habit of amusing myself at my patients' expense in that way.

14,496. You say that you do not remember what the terms of the certificate were that you gave?—No; I believe it is correct as regards the convulsions, as she states; I will not be absolutely sure, but that I can verify for you.

14,497. Had the child suffered from convulsions?—I believe it had, but I would not be positive; that is just where my memory is at fault.

14,498. Is the description which she gives of the child's head: that it "was double the size that it ought to be, and after the child's death it was the colour of ink; there was not a joint or part about it which was not completely cracked open"; is that in accordance with your recollection?—Certainly not; it is a fictitious case altogether, I have not the slightest hesitation in saying so.

14,499. The statement that she makes is that the arm "showed a large black hole; it never became a pock mark at all; it made a deep hole in the child's arm large enough to hold, they say, a pea; but I say large enough to hold an ordinary sized Barcelona nut." What do you say to that?—I have never seen anything of the sort in my life; that is not my experience of vaccination.

14,500. She says that "there was no skin at all; it was a large deep hole constantly running"?—The whole thing was inquired into by the Barrow-on-Soar Guardians; they sent a couple of the Guardians to report to the chairman upon the matter; the whole thing was thoroughly threshed out, and I was entirely exonerated from any blame.

14,501. (*Dr. Collins.*) Does a copy of the report exist?—I do not know. I can give you the name of one of the gentlemen who had to make the inquiry.

14,502. (*Chairman.*) What is his name?—Mr. Stevenson, a Guardian of the Barrow-on-Soar Union.

14,503. It is stated that when she told you that she blamed the vaccination for it, you only laughed at her; is that correct?—That is in accordance with all the other statements; they are all untrue absolutely.

14,504. Then, in answer to the question, "From what did he vaccinate your child," she said you took the matter off a shilling?—That is the only part that is correct. I have always, ever since I have been a Public Vaccinator, kept a shilling which, together with my own instruments, has always been rendered aseptic, that is to say, they have always been washed in a solution of carbolic acid prior to use; I have simply used that for convenience; it has never been used for any other purpose, and that you can verify if you like to wire to my assistant, who will tell you so.

14,505. Then she says you "vaccinated two other children from the same shilling, which two other children were nearly in as bad a case as mine;" is that true?—I will not say whether there was one, or whether there were two or three or four; there was this one child that I vaccinated which did perfectly well after vaccination; there is nothing in that statement whatever; it is founded upon falsehoods from beginning to end. I saw the child scores of times afterwards, and so did the Barrow Guardian. I know Mr. Stevenson went to visit the child.

14,506. (*Sir William Savory.*) Do you say Dr. Neale contradicted this in the public papers?—Yes.

14,507. Could you find that paper and let the Commission have it?—I do not know that I could do that,

but I daresay if you were to write to Dr. Neale he would look it out; but it was in the public papers, and it was well known at the time.

14,508. In what paper was it published?—I believe it was in the "Daily Post."

14,509. It would be possible to get the number with a little trouble, would it not?—Yes, it might be.

14,510. Dr. Neale would probably assist you?—Yes, I will endeavour to obtain a copy.

14,511. How did you use the shilling in the process of vaccination?—I am not quite positive, but I believe this was vaccine that I obtained from the National Vaccine Institution.

14,512. In tubes?—Yes.

14,513. Then you blew it out on to the shilling?—Yes.

14,514. This shilling you keep for the purpose?—Yes, I keep the shilling for the purpose in some cotton wool in a drawer with some other instruments that are always washed immediately before I vaccinate, and immediately afterwards, the whole of the instruments, the shilling included.

14,515. After the vaccination how often did you see the arm yourself?—I inspected it the next week; I cannot say how many times I saw it afterwards. I cannot tell you that even if I were at home.

14,516. Can you tell me how long before the child's death was the last time you saw it?—I am afraid I could not.

14,517. Can you say what state it was in when you saw it?—I cannot.

14,518. Can you say that it was not in a seriously mischievous condition?—I can positively say that it was not suffering as the result of vaccination; it was not suffering from blood poisoning, that I can swear.

14,519. (*Chairman.*) Did you keep any notes of the case?—No, not more than of an ordinary case.

14,520. (*Sir William Savory.*) Is it your impression that this arm pursued the ordinary course?—It is; I have no doubt whatever that it did so.

14,521. (*Sir James Paget.*) With regard to the black portion spoken of, the hollow space that was left, had you any opportunity of observing that?—It is untrue; I saw the child and inspected the arm. I believe the woman brought it two or three times to my surgery, and I think I called and saw the child shortly after death; that is my impression now, but I would not vouch for it. At all events, she certainly did bring it to the surgery.

14,522. Could that cavity have existed in the arm upon any days upon which you did not see it?—I do not think so. The way that this matter came out was this: a lot of scurrilous letters were written to the newspapers, which I refused to answer. I declined to enter into the vaccination controversy with men who used such methods as they used. I waited until the thing was taken up by the chairman of the Board of Guardians, who saw me and asked me what I thought of the matter. I told him I was exceedingly sorry that this difficulty should have arisen, but that it was absolutely untrue, and he repeated that statement to the Board of Guardians. It was taken up again by Mr. Burns, the chairman of the Board of Guardians. He wrote to me to ask me to write a letter formally, explaining how this matter was, and what was the condition of the child. I believe upon that they commissioned those two gentlemen to whom I have referred to make inquiry into the case, which was done, and they were perfectly satisfied.

14,523. (*Mr. Picton.*) Were they medical men who made the inquiry?—No.

14,524. (*Chairman.*) Could you remember when that was; was it shortly after the child's death?—I cannot say, I do not think it was very long afterwards; it was four years ago and the whole thing is practically wiped out from my memory except from those letters.

14,525. (*Mr. Whitbread.*) You have a very wide experience of vaccination?—Yes, I have had a fair experience of vaccination.

14,526. You never in your life saw a case of a sloughing sore, or a running sore, upon the arm of a child vaccinated?—I should not like to be positive about that; I have seen several cases of erysipelas, but I have always been in my own mind able to trace that to the filth and dirt about the place. There are a large number of poor people who have their children vaccinated, and they have



no idea that the filth about their house or houses has anything to do with vaccination, and if a child's arm gets a bit inflamed, no matter how dirty they are or how much care the Public Vaccinator may take in vaccinating, they put it all down to bad lymph.

14,527. But still that erysipelas would not have existed if it had not been for the vaccination punctures, would it?—I daresay the puncture was the starting point, but still a man may have a cut in a bad finger and get erysipelas up his arm from septic poisoning.

14,528. You are aware that one of the great difficulties in enforcing vaccination amongst the children of the poor is that they are not able, even if they were willing, to take those precautions about cleanliness which are adopted by people who are of better means?—I do not agree with that; I think everybody can get soap and water.

14,529. You think that a mother who has to take care of a large family, and to do the household work of the family is in as good a position to take care of the cleanliness of her child as a wealthier person who can employ a nurse especially for the purpose?—A mother, by which I mean a good mother, would do so; there are plenty of poor people who are quite as clean as rich people. I know many poor families who have to work hard to get a living, to whom that applies; not one or two, but scores of people.

14,530. When you stated just now that you had never in your life seen a case of that sort?—I am not going to say positively, because I cannot call to memory any single case; I know that I have seen cases of erysipelas and inflammation of the arm, but I have never had a really bad arm.

14,531. (*Mr. Meadows White.*) You say you never had a really bad arm with erysipelas?—Yes; slight cases I except. I cannot call to mind any particular instances, but I do not know that I ever had a bad arm.

14,532. With regard to the certificate, you do not remember the exact terms of that?—I could not recall them.

14,533. But whatever the terms of it were, was it given to the best of your ability and knowledge?—Yes, it was.

14,534. Have statements been made in public at all with regard to this case?—Yes, they were made in the public press.

14,535. Were they made at any meetings?—I believe they were made at one meeting, but I treated them as beneath contempt.

14,536. (*Mr. Picton.*) I should like to understand clearly how far you say that this account given by the former witness is fictitious. I think your words were: "It is a fictitious case altogether"?—As regards that second child, the whole of the evidence is absolutely false from beginning to end. As regards the great majority of the other people's evidence, I am perfectly willing to acknowledge that the great majority of the cases are true.

14,537. I do not understand you to say that the case alleged with regard to Annie, the daughter of Kate Hart, is entirely fictitious?—It is entirely fictitious, with the exception of the mere fact of the vaccine being taken from a shilling.

14,538. With the exception of that it is fictitious?—Yes, all but the fact that I vaccinated it and inspected it.

14,539. You did not see her until seven days after vaccination?—No, that is the usual time; the following week.

14,540. Is it untrue to say that at that time she was ill, beginning to swell in her joints?—Those are all symptoms of blood poisoning. I say it is absolutely untrue.

14,541. I understand you do not mean to say that it is absolutely false that those symptoms were present?—I say they were not present; when I examined the child there was nothing of the sort.

14,542. Was there no swelling of the joints?—There was no swelling of the joints; not to my personal knowledge now. I am not going to swear absolutely that every word I say now is true because my memory will not carry me back quite as far as that.

14,543. Then you saw the child again; do you remember how long afterwards?—I could not tell; I believe I saw the child several times.

14,544. Upon no occasion did you see anything that could be called a hole in the child's arm?—I did not.

14,545. That you say is absolutely false?—It is indeed.

14,546. How soon did this story begin to be told?—I cannot tell you that; I remember perfectly well the woman told me that some gentlemen had gone to her on the Sunday afternoon; they wrote out a statement and got the husband, I believe, to sign it. The first thing after that was this appearance of the thing in the papers, and that was carried on for several weeks.

14,547. Was that soon after the death?—I could not tell you that; I do not think a very long time elapsed; it might have been a week, or a day, or a few days; I could not say.

14,548. As to the answer you gave to Mr. Whitbread just now, as to the power of poor people to keep their children clean; it is a fact, is it not, that a great many mothers in Leicester have to go to work during the day?—A great many do, but not people as a rule who have many children; it is generally the young mothers, that is to say, people with one or two children; but the majority of the mothers do not work.

14,549. Do you know whether Mrs. Hart was working at the time?—I do not think she was; she was generally standing at the door nursing her children. I think she did very little work generally.

14,550. (*Dr. Collins.*) You are a Justice of the Peace?—Yes.

14,551. Have you taken any part in administering the Vaccination Acts?—No; I have not had that pleasure.

14,552. You are a Public Vaccinator under contract, I suppose?—Yes, at so much per head.

14,553. Under the Local Government Board?—Yes, under the Local Government Board.

14,554. Do you hold a vaccination certificate?—Yes, I do, and I have had the vaccination grant on several occasions for efficient vaccination.

14,555. The full award?—I believe so; I have had several sums of money.

14,556. Will you tell the Commission on how many occasions?—I believe three, but I could not be positive whether it is two or three.

14,557. That is, the additional award for the excellence of the work done?—Yes.

14,558. When was the last award, can you tell us?—I think it was immediately after this case of Hart's, shortly after, it might be 12 months, I do not know.

14,559. If it was after this occurrence, you happen to know whether this occurrence was taken into consideration by the inspector who recommended the award?—I do not know at all. I should think not, but I know very well he came round. He takes his book and picks out some cases and goes round and looks at them and sees whether they are proper arms, and then he makes the award. I do not know his *modus operandi*. At any rate, he takes twelve cases picked out at random. I believe that is the number.

14,560. At any rate, if it came to his knowledge it did not operate in the direction of inducing him to suggest the reduction of your award?—No.

14,561. Of course you carry out the conditions of the contract?—Yes; I do, I believe.

14,562. It is the duty of a Public Vaccinator to carry them out?—Yes.

14,563. The first regulation is, "Except so far as any immediate danger of small-pox may require, vaccinate only subjects who are in good health"?—Yes, that is what we endeavour to do.

14,564. So I take it the child necessarily was in good health?—Yes, apparently.

14,565. It is also true, is it not, that the child died six weeks afterwards?—I could not tell you that.

14,566. Have you any reason to think that is untrue?—I could not say whether it is one way or the other. I should think it is probably correct.

14,567. You think the vaccination had nothing to do with the death?—I am perfectly certain it had not; I am as sure as anyone can be of anything in this world.

14,568. I do not think you told the Commission the number of times you saw the child after it was vaccinated?—I could not tell you. I saw it on the seventh day, and I think the child was brought to my surgery

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*Mr. A. W. Emms.* two or three times afterwards, but I could not tell you that; I do not think I visited it.

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14,570. Could you tell the Commission why it was brought back to you after the eighth day?—No.

14,571. Did you examine the child?—As I tell you, I am uncertain about that matter, and I have no means of finding out. I daresay the child was brought to me that I should see it. You must remember I had been attending these people. They owe me some money now, and I should be very glad to find out where they have gone to.

14,572. You have seen irregularities in vaccination, no doubt?—I do not know about having seen irregularities, but I have seen inflamed arms which every vaccinator has seen.

14,573. Do you think there is never any irregularity to be seen after vaccination?—I cannot say what other people see.

14,574. Do you say that vaccination never produces any evil effects?—I have never seen any evil effects, but I am very glad that the Vaccination Act is not in force in our part.

14,575. I thought you told us that you regretted you had not the pleasure of carrying out its provisions?—You asked me in a judicial capacity. I know it was no end of worry and bother for me at the time.

14,576. Is it possible that the child was brought back to you after the day of its inspection on account of its having erysipelas?—It never had erysipelas at all.

14,577. How do you know?—I am perfectly certain.

14,578. What examination did you make to ascertain that there was an absence of erysipelas?—I tell you I saw the child, and from the appearance of the child I am perfectly sure there was no erysipelas.

14,579. You told the Commission that you never saw the child at its own home?—I cannot tell you anything of the sort. I cannot tell you the details you are asking me; it is only wasting my time, because I cannot remember all these details.

14,580. Will your memory help you as to whether you saw the child in a fit of convulsions?—No.

14,581. Did you not see the child in convulsions?—I cannot tell you at all.

14,582. What in your opinion was the cause of death?—I am not going to express an opinion at all. I cannot tell you because I have forgotten the fact; but I will find out and send you the cause of death; at all events it was not due to blood poisoning.

14,583. Is there any mode in which vaccination might cause death apart from blood poisoning?—There may be other ways, but it is not within my experience.

14,584. Are there a good many causes of convulsions?—Yes, heaps.

14,585. Do you think vaccination might be one of the heap?—I have never seen a case in which vaccination has produced convulsions.

14,586. Does vaccination set up a febrile condition after the eighth day?—I have no experience much of vaccination after the eighth day.

14,587. Do you think if you had more experience after the eighth day you might have seen ill results?—I might have done so. I do not think it does; perhaps there is a little redness round it, but nothing of any consequence.

14,588. Do you think that if you had the opportunity of seeing children after the eighth day you might see other ill results?—I do not think I should see any ill results; I have never seen any ill results from vaccination.

14,589. Apparently that remark is based upon your observation which is limited to the eighth day; is that so?—The fact of the matter is that if the child is brought to one to be examined one does not go about to each house afterwards to see how the child is getting on.

14,590. Is it your experience that the effect of vaccination really terminates by the eighth day?—Yes; living in a suburb of Leicester, which is practically a little township, and the large majority of the people and their children being patients of mine, if any ill effects had arisen after vaccination I should have been called in certainly.

14,591. Do you advise the parents to bring their children back to you if there is any irregularity after the eighth day?—No. I am the only medical man in the place, and if any irregularity had arisen the children would have been brought back to me.

14,592. Do you not think it would be well to take notes of every case in which injury is supposed to result from vaccination after the eighth day?—I have never seen any injury supposed to result from vaccination after the eighth day. As to this case I do not believe it is worth the paper it is written upon.

14,593. You do not believe that there are any evil results of vaccination?—I have never seen any in my experience. I cannot speak for the experience of other people.

14,594. It would be quite possible for you to have a new experience, would it not?—It would; I have had plenty of new experiences.

14,595. I understood you, in answer to Sir William Savory, to say that when you last saw the child it was not in any seriously mischievous state?—I do not believe it was.

14,596. I should like to know what its state was?—My memory will not carry me back after four years to such minute details as that.

14,597. Apparently, the child died shortly after that?—I cannot answer that; but, fortunately for vaccination, the child was seen by one of the physicians of the Leicester Infirmary, and he will corroborate my evidence that the child did not die from blood poisoning.

14,598. Did he attend at its death?—I cannot tell you that; the child was taken there; but how many times he saw it I cannot tell you.

14,599. Do you keep up a weekly stock of lymph?—I cannot keep any now, I am sorry to say.

14,600. How do you provide the lymph for vaccination?—I have very little to do with vaccination; what little I have to do I generally get some calf lymph for.

14,601. From what source?—I get it from the Calf Lymph Institution.

14,602. Do you carry out the fifth direction, "To provide against emergencies always have in reserve some stored lymph; either *dry* on ivory points, thickly charged and constantly well protected from damp; or *liquid*, in fine, short, uniformly capillary (not bulbed) tubes, hermetically sealed at both extremities"?—You cannot do so at all when there is no vaccination going on; you cannot keep vaccine if you do not vaccinate people.

14,603. It was not always in the same state as it is now at Leicester, was it?—No. As far as possible I do observe that regulation.

14,604. I believe Public Vaccinators sometimes send tubes and points to Whitehall do they not?—I have never done so.

14,605. Do you recommend the use of any protection or dressing for the arm to protect from the filth which you described as the source of erysipelas?—I believe in keeping the arm perfectly clean; shields and all those things are an abomination, and ought never to be used; the arm ought to be tied up so as to leave the marks clear.

14,606. Do you think it is more or less liable to the introduction of filth if it is left open?—No, I say I leave it open, that it is less liable. It is a great habit amongst poor people to use shields, and they are frequently used over and over again. At all events I have seen them used in that way when brought to the vaccination station.

14,607. If the pocks have been opened upon the eighth day for taking a supply of lymph, do you still recommend that the arm should be kept open?—Yes; always keep the arm clear, that is my advice to the people; to avoid friction or irritation. If you tell them to use covers they will use them over and over again.

14,608. If the pocks had been opened upon the eighth day, and were exposed to filth, which you say is a source of erysipelas, it is not improbable that the erysipelas might attack the vaccinated arm?—Yes, no doubt.

14,609. Do you think that a filthy condition is common amongst those who resort to the public vaccination station?—No, I cannot say that it is common, occasionally cases crop up.

14,610. Do you carry out Regulation No. 1 to the extent of ascertaining "that there is not any febrile



"state, nor any irritation of the bowels, nor any "unhealthy state of skin; especially no chafing or "eczema behind the ears, or in the groin, or elsewhere "in folds of skin"?—I always examine the child and if I consider it healthy I vaccinate it; if I have any doubt about it I send it home.

14,611. What is the nature of the examination you make?—I make a personal examination.

14,612. How do you ascertain that it is not in a febrile state?—Easily enough.

14,613. Would you kindly explain?—I feel its pulse and examine it.

14,614. What condition of pulse would, in your opinion, render a child unfit for vaccination?—If it were feverish it would have a flushed face and a quickened pulse, and then I should send it home.

14,615. Does the examination for eczema, &c., require the stripping of the child?—No; you cannot strip every child that is brought to the vaccination station; if I had any doubt I should have the child's clothes off.

14,616. Do you frequently make an examination of that kind?—No.

14,617. Do you disturb the clothing at all?—No; sometimes you see a few spots upon the head or upon the arms, and in a case of that kind I do not vaccinate at all. If I have the slightest doubt in the matter I prefer waiting.

14,618. In Regulation 6 we are told, "Never either "use or furnish lymph which has in it any, even the "slightest, admixture of blood"; do you carry out that regulation?—Yes, of course I do.

14,619. How do you secure the absence of blood?—By not making the arm bleed.

14,620. Could you tell us how that is done?—By pricking it.

14,621. Can you eliminate the red corpuscles with certainty?—If I had made the arm bleed in taking the vaccine I should not touch it.

14,622. Can you eliminate the blood corpuscles with certainty from vaccine?—I cannot tell you that. I should not take any matter from a child where I had made the arm bleed.

14,623. I am afraid you do not quite understand the question?—I do. If in pricking the vesicle the child moved its arm, which it does sometimes, I happen to make it bleed a little I should pass the child on.

14,624. You mean obviously bleed?—I do.

14,625. Might there not be also blood in the vaccine which would not be perceptible to the eye?—No; you can see it; blood is plain enough to see.

14,626. Are the corpuscles visible?—Yes, the blood is red.

14,627. May not the lymph contain the elements of blood, that is to say, the red and white corpuscles without your seeing them?—It cannot contain the red corpuscles without your seeing them.

14,628. That is your opinion as a Public Vaccinator?—It is.

14,629. (*Sir Charles Dalrymple.*) You remember the circumstance of the woman crying in your surgery; at what period was that?—When she came for the certificate of death; that is my only regret about the case that I did not insist upon having an inquest; that is the only error of judgment I made in the whole case.

14,630. What did you understand she was crying about?—She complained to me of those gentlemen

calling upon her. She said she was sorry for what they had done, and from her description the only thing I could gather was that it was not her doing or her or her husband's wish.

14,631. Did you make any complaint to her about the statements which had appeared?—I asked her, and that is absolutely true which I am telling you.

14,632. (*Chairman.*) Did you give a certificate of death, although you had not seen the child for some little time?—I daresay I had seen it within two or three days of its death or I should not have given the certificate.

14,633. (*Mr. Whitbread.*) Your attention was very much called to this particular case owing to the controversy in the press at the time about it?—I am not sure about that, most of the controversy took place after the death; there is no doubt something did come up by which my attention was called to the matter. I believe one of the statements was published prior to the death of the child, or at least immediately after.

14,634. You are quite clear in your own mind that the child did not die from anything the result of vaccination?—I am absolutely certain so far as a man can be certain of anything in this world.

14,635. It was fresh in your mind?—It was fresh in my mind, and it was completely corroborated without my communicating in any shape with the Infirmary. This statement appeared in print that the child was taken to the Infirmary of Leicester, and that the doctor there said it was suffering from blood poisoning the result of vaccination. He immediately wrote the next morning a letter contradicting the statement that the child was suffering from blood poisoning when brought to him. The child died, I think, a day or two afterwards.

14,636. Although your attention was so called to this case as to make it quite certain that the child did not die as the result of vaccination, your memory appears to be as complete blank as to what was the cause of death?—It is undoubtedly. I could not tell you, but I will give you a copy of the certificate of the cause of death, if possible. I came here, as I told the Chairman, totally unprepared to be examined on this case. I merely came up to town for my own purposes, and therefore I have had no means of looking up or attempting to look up anything in reference to the case whatever.

14,637. (*Sir William Savory.*) Do you know how many children you have vaccinated, roughly speaking, from first to last?—From 1,500 to 2,000.

14,638. Have you never known any serious result to follow vaccination?—Never in all my experience.

14,639. (*Mr. Picton.*) Did you make a report to the Local Government Board upon this case?—I do not think so.

14,640. There was no inquiry, was there, made by them?—I do not think so.

14,641. You said in answer to Dr. Collins that you were glad the law was not carried out in Leicester; what was your reason for saying that?—My reason for saying that was that I had such a sickener over this case that I did not want to have anything more to do with vaccination.

14,642. (*Mr. Meadows White.*) You say, whatever will be found upon the certificate, that is the impression you formed from the facts so far as they were brought to your knowledge?—You may depend upon it that what I put upon the certificate was in my judgment at the time the cause of death.

The witness withdrew.

Mr. THOMAS WILLIAM THORNTON examined.

14,643. (*Chairman.*) You are a farmer residing at Tugby, near Leicester?—Yes.

14,644. And you are a native of Leicester and lived there until the last few years?—Yes.

14,645. At one time you believed in vaccination?—Yes.

14,646. What led to your ceasing to believe in it?—I was taught to believe in vaccination, and did so until

from experience in my own family I learned that it was of no use as a prevention of small-pox. My sister Mary Jane was vaccinated when four months old, in June 1868, and afterwards had small-pox.

14,647. When did she have small-pox, can you give us the date?—It was in 1872, the early part of it. Immediately after vaccination her arms became swollen and inflamed and were covered with vesicles resembling the vaccination pustules, and these spread over parts of the

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body. She was ill for nearly four years. Both my sisters suffered from small-pox although vaccinated while I escaped.

14,648. Have you been vaccinated?—Yes. My wife's sister, Lily Fryer, suffered terribly from vaccination. Inflammation and abscesses followed, and she was a long time before she recovered. A friend of mine living near to me had a sister seriously injured. I decided when my own children were born that I would not submit them to the operation. On August 7th, 1885, I was summoned before the East Norton Magistrates. I made a defence before the Bench, but was fined 10s. and 12s. 6d. costs. On 7th December 1888 I was again summoned before the East Norton Bench, and although

I made a defence and cited my experience in my own family and in my friends' family I was again fined 1l., including costs. The law presses very heavily upon us in country districts. We have to travel one and a half miles to the court and in addition to the fine and costs amounting to 1l. or more, there is the loss of time, which makes an additional hardship

14,649. (Mr. Meadows White.) In what year was it your sister had small-pox?—In 1872.

14,650. That was the time of the epidemic?—Yes.

14,651. Were you living in Leicester then?—Yes.

14,652. Did they have the illness severely?—No, in both cases mildly.

The witness withdrew.

Mr.  
J. Stafford.

Mr. JOSIAH STAFFORD examined.

14,653. (Chairman.) You live at Billesdon, near Leicester, and you are a farmer?—Yes.

14,654. Was one of your sisters vaccinated when about a year old in May 1853?—Yes.

14,655. By Dr. Franks?—Yes.

14,656. How old were you at that time?—I was not born at the time.

14,657. The statement you are going to make is what you have derived from your own parents, I suppose?—Yes, and from my knowledge of my sister during my life.

14,658. In what year were you born?—I am 30, so that I should have been born in 1861.

14,659. What did you learn about your sister?—I knew that my father said that when she was vaccinated her arm turned quite black, and she was thrown into very violent convulsions, and lay in them a very long time; I forget exactly the period, but for one or two days; from that time she was never right afterwards.

14,660. What condition was she in so far as you knew her?—She had epileptic fits, which resulted from the vaccination, and she had all sorts of medicines tried, and

she was an out-patient at the Leicester Infirmary for a good while, but they did her no good.

14,661. She was suffering from these epileptic fits?—Yes, and mental derangement too.

14,662. Were you vaccinated yourself?—Yes.

14,663. Were some of the other children vaccinated and some not?—That part of the evidence refers to my own child and my brother's children.

14,664. But in your own family, your brothers and sisters, how many were there?—I have three brothers and one sister now.

14,665. Were they all vaccinated?—Yes, they were vaccinated; but another one was thrown into convulsions at the time of the vaccination.

14,666. Your sister you have been speaking of died in 1889, I think?—Yes, and when she died my father told the doctor that it was the result of vaccination, and he did not say it was not. He never objected to the statement at all.

14,667. In consequence of what you have told the Commission you became opposed to vaccination, and have not vaccinated your own child?—No, I have not had her vaccinated, and do not intend to have.

The witness withdrew.

Mr.  
J. Banbury.

Mr. JOHN BANBURY examined.

14,668. (Chairman.) You are a whitesmith, living at 24, Queen Street, Leicester?—Yes.

14,669. And you have been long opposed to compulsory vaccination?—Yes.

14,670. You have three children, and I believe you have been summoned and fined three times for their non-vaccination?—Yes.

14,671. Your first child was born on the 31st of March 1875, and you were summoned on the 25th of October, and fined 20s. or ten days' imprisonment?—Yes.

14,672. You were similarly summoned and fined in respect of your other children?—Yes.

14,673. The third time, I believe, you refused to pay the fine, and your goods were seized under a distress warrant?—They were.

14,674. Is your eldest daughter Emily now engaged as a pupil-teacher under the Leicester School Board?—Yes.

14,675. In December 1890 did she pass her first year's examination?—In 1889 she passed her examination as a candidate, and in 1890 she passed her first year's examination.

14,676. She has not received the usual grant of 1l., has she?—No.

14,677. What was the reason?—Because she has not been vaccinated.

14,678. Was there a correspondence between you and the School Board with regard to that?—Yes.

14,679. Upon the 12th of November did the clerk to the School Board write to you asking what you had decided to do in respect of your daughter's vaccination, stating that unless the required certificate was produced to Her Majesty's inspector he doubted whether the Education

Department would allow your daughter to complete her apprenticeship?—That is so. (See Questions 13, 129-44).

14,680. In answer to that did you write the following letter: "In your memo. of November the 12th you express a doubt whether the Education Department will allow my daughter to complete her apprenticeship unless a certificate of successful vaccination is produced. Permit me to say in reply that, after the statement of Mr. Ritchie in the House of Commons it is extremely doubtful whether the Education Department has the power legally to impose a disability on a pupil-teacher. Mr. Ritchie, on the 17th February 1888, said: 'It was not binding on Boards of Guardians. The Order was merely a communication, and it rested entirely with Boards of Guardians to exercise their discretion in the matter.' Again, on July 5th, 1888, Mr. Ritchie said that the Local Government Board could not interfere in the exercise by the Guardians of their powers. The enforcement of the Vaccination Act is committed to an elective tribunal, and they must use their discretion in the cases that come before them."—Yes.

14,681. "It is evident that the law of vaccination which has been regarded as compulsory is not so really, and its administration rests solely upon the will of the Guardians for its operation. This being so, and the Education Department having imposed the disability under the erroneous belief that it was compulsory, the obligation is no longer in force; indeed, it is more than doubtful whether it ever had any legal force. It therefore rests with the School Board itself whether it desires to impose this disability, which I cannot believe, especially after the attitude taken upon this question, not only by the people of Leicester, but by the only authority for dealing with this subject, that is the Board of Guardians itself. The



“Leicester Board decided, by 27 votes to 8, in 1886, that it would not enforce the law, and this vote was confirmed in 1889 by 31 votes to 3. The only legally constituted authority thus declining to move, no other power exists to enforce the operation”?—Yes, that was my letter.

14,682. In answer to that did you receive this letter : “Dear Sir—In reply to your letter of yesterday’s date you are in error in supposing that the question of vaccination of pupil-teachers rests with the School Board. The matter is entirely in the hands of the Education Department, who alone have power to approve of and issue apprenticeship indentures for pupil teachers, and it is for the Department to say whether an indenture will be issued in a case where the requirements with regard to vaccination have not been complied with. It is necessary for the Board to satisfy Her Majesty’s inspector at the examination that the requirements of the Department have been complied with. I shall, therefore, be glad if you will at once forward to me the medical certificate sent to you some time ago, together with an intimation that you refuse to comply with the requirements as to vaccination, if that is your decision. The case will then be tested on the papers being forwarded to the Department by Her Majesty’s inspector.” Then on the 28th of January 1891, did the clerk to the School Board send you an extract from a report of Her Majesty’s inspector for the Belgrave Road School?—Yes.

14,683. That was in these terms : “It appears from E. A. Banbury’s medical certificate that she has not been successfully vaccinated. Until this operation has been effectively performed my Lords cannot, both for her own sake and in the interests of the children attending the school, consent to her engagement”?—Yes.

The witness withdrew.

The Reverend JOHN PAGE HOPPS examined.

14,691. (*Chairman.*) You reside at Lea Hurst, Stoneygate Road, Leicester?—Yes.

14,692. And you have lived in the neighbourhood for 14 years?—Yes.

14,693. You are not yourself a member of the Anti-Vaccination Society?—I am not; but being engaged in public work, as a minister of religion and a politician, I have naturally been deeply interested in the subject of vaccination. I have had special opportunities of coming into contact with the working classes of the town, and have seen them from many points of view. For seven years I conducted special services in public halls on Sunday afternoons and evenings, the audience averaging 2,000 adults each service, chiefly from the wage-earning classes. My duties and calling have also given me considerable opportunities of seeing, at their own homes, the people who oppose vaccination, and I have presided at some of their meetings. On the whole, as the result of my observations and experience, I have been gradually brought over to the view that vaccination is by no means a necessity, and that the attempt to enforce it must lead to constant conflicts between good citizens and the administrators of the law. My experience in Leicester enables me to testify to three facts concerning the great majority of those who are opposed to compulsory vaccination. I can testify, firstly, that they are by no means opposed to sanitary regulations and to sanitary authorities, but the reverse. The people of Leicester, in fact, take kindly to all kinds of inspection. The town Medical Officer and his staff are their recognised friends. Cleanliness is the fashion. They dislike vaccination, because it suggests possible salvation by filth, and they prefer obvious salvation by sweetness. The isolation of disease is being preached and practised. For nearly a generation we have practically had no small-pox, and less and less vaccination. It is no wonder that the people prefer to stick to an amazingly successful experiment, an experiment which has, by its success, enabled them to control the Board of Guardians, to win over the Town Council, and to virtually silence the magistrates. The people of Leicester claim that they are proving the possibility of abolishing small-pox by improved conditions of life and better habits. So far, then, from resenting sanitary interferences, they are really favourable to them. One small but really signi-

14,684. Your daughter has passed the examination?—Yes, well.\*

14,685. Did she gain as many marks as had been gained by other pupil-teachers for the same year?—Yes, that is my statement.

14,686. You feel it to be a hardship, that under those circumstances she should not be acknowledged by the Education Department as suitable for apprenticeship?—Yes, it also shows to me that the grant is made for vaccination and not for education. She has qualified herself as a teacher, and she has also passed her examinations equally well with others, in fact, I saw her tutor last night and I asked him the question, and he said her papers were done as well as those of any who had passed their examinations, and better than some.

14,687. (*Mr. Picton.*) Would you kindly tell me what your idea is. Is it your point that vaccination being practically abandoned in Leicester it is a special hardship upon you to insist that your daughter should be vaccinated?—Yes; and not only that, but every time she is examined she will lose this grant, which the other pupil-teachers will get, and it is very discouraging for her to go on.

14,688. The children in the school, presumably, are not vaccinated, are they?—A large portion of them are not.

14,689. (*Dr. Collins.*) Does the regulation of the Education Department require vaccination?—Yes.

14,690. Whereas the Vaccination Act is not administered in your locality?—That is so.

\* I am morally sure, but cannot actually prove, that my daughter passed the Government examination, as they have not communicated the result because she is not vaccinated. The latter clause of my answer to Question 14,686 is my positive statement—J. B.

ficant fact may be mentioned as showing the tendency of the working classes. They have in large numbers attended discourses of mine on the Medical Officer’s reports, and at the close of great gatherings of working people on Sunday evenings they have largely availed themselves of opportunities which I gave them to purchase copies of publications on sanitary matters, thus showing their keen interest in the subject. I can testify, secondly, that the people of Leicester who are resolute against vaccination are not turbulent persons and law despisers, but to a considerable extent thoughtful and well-conducted persons. In fact, my own long experience has led me to the conclusion that it is precisely the thoughtful and well-conducted among the working class who make a stand against what they regard as injurious. My conviction is that not lawlessness but a deep sense of duty is at the bottom of their refusal to obey the law. I can testify, thirdly, that a very general growing and deepening conviction exists that vaccination is followed by mischief, a conviction which is held as a result of personal experience, as the result of cases seen among friend and neighbours, or as the result of thoughtful study. In consequence, they hold that there are no means of testing lymph, and they say vaccinators admit that they do not know what they are putting in, and what they will bring out. This widespread opinion in Leicester is partly due to the admissions of medical journals which are eagerly perused by the people. I may cite one case. An extract from the “Medical Times” on this point produced a distinct impression in Leicester about six years ago; it is as follows : “The possible communication of diseases by means of vaccination has always been one of the strongest arguments of its opponents; and even parents who entertain the fullest belief in the protection afforded by it against small-pox not unfrequently submit their infants to the operation with reluctance and apprehension. Such scruples merit careful consideration, for not only has the transmissibility of syphilis been proved by disastrous consequences, but, where vaccination has been improperly performed, whether through ignorance or negligence, every description of blood poisoning has been produced. In the case of erysipelas the danger is great and palpable.” I quote that from the “Medical Times” as a matter which

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has interested very much the people of Leicester. But not only is the possible communication of disease by vaccination believed very generally in Leicester, it is also maintained that latent tendencies to disease may be excited into activity by vaccination, and the admissions of medical men are freely cited as justifying this opinion. I will only mention one instance of that within my own knowledge. Conversing with a medical man of very wide experience, and a staunch advocate of vaccination, I ventured to put to him the question, "Can you tell me what you are doing when you vaccinate a child?" I asked him, for instance, whether if when a tendency to some disease was lurking in the system it might not be excited into activity by vaccination. He became very grave and said, "That is true, a child may have such a tendency lurking in its system, and if the child can get over the first few years of its life and gather strength the latent tendency may never appear." Being pressed, he then admitted that I had opened up a very grave subject, and one that suggested difficult and serious considerations. These facts have slowly led me to the opinion that Leicester has been engaged in working out a most important problem, and trying a valuable experiment for which all England should be grateful, and which ought to be watched with sympathetic interest. And I submit that it is bad policy to prefer a medical theory to the sustained experience of a whole community, and that it is specially bad policy to attempt compulsion when compulsion must not only mean a conflict with the most sacred sense of duty, and ceaseless conflict with the law, but the interference with an experiment which may end in the admission that Leicester has been showing the country the better way.

14,694. (*Mr. Whitbread.*) How long have you known the people of Leicester?—About 14 years.

14,695. In your opinion is this anti-vaccination feeling in Leicester a wave of feeling passing over the community which may be looked for as temporary, or do you see any signs of its relaxing in force in any way?—No, certainly not. I should say that during my 14 years of living there in close contact with the people it has been steadily growing and deepening in this way; that whereas, when I knew it first, it was very much what may be called a popular movement, it has now taken hold of other classes, so that, as I said in my statement, the Board of Guardians, the Town Council, and the magistrates have been practically, I will not say won over, but silenced; it has spread so much amongst all classes.

14,696. Have those classes been won over to the extent of not having their own children vaccinated, do you think?—I really cannot say; I should think it is very likely, but I do not know.

The witness withdrew.

Rev.  
R. Caven,  
B.A.

The Reverend ROBERT CAVEN, B.A., examined.

14,710. (*Chairman.*) You are the minister of the Charles Street Baptist Chapel, Leicester?—I am.

14,711. When your attention was first called to the subject of vaccination you held a similar office at the East Street Baptist Church, Southampton?—I did.

14,712. I believe you have a statement of the matters which you wish to bring before the Commission?—I have.

14,713. Will you be good enough to read it?—I wish to present a few facts which coming strictly within the range of my own experience rendered it impossible for me to comply with the law which required my children to be vaccinated without infringing the most sacred obligations of a parent. I have been summoned seven times to appear before the magistrates for non-compliance with this law; five of those times being in respect of one child. When my first child was three months old, which is now more than 19 years ago, I felt it my duty to see that the law requiring its vaccination was complied with; and I requested Dr. Aldridge, of Southampton, the medical man who had attended at his birth, to vaccinate the child. In reply to my request he said, "Is your child getting on well?" and on learning that it was, he added, "Then I should let it alone, as its vaccination may throw it back." "But," I replied, "the time is up, and the authorities will be giving me trouble." "In that case," he said, "refer the Officer to me," and he added, "if small-pox

14,697. (*Mr. Picton.*) I wish to ask you, what do you think would be the effect of an endeavour to enforce the vaccination laws in Leicester now?—I do not know; you would want a great deal of money to pay the fines.

14,698. But supposing imprisonment were insisted upon; suppose there were fresh means taken to enforce the law in Leicester, a determined effort made on the part of the Imperial authority, what do you think the result would be?—You simply could not do it; it would be physically impossible.

14,699. It is a case in which force would be no remedy?—You would want soldiers from London.

14,700. There are soldiers in Leicester without coming to London?—The soldiers in Leicester would be in our favour, I should think, if anything.

14,701. Do you think it would be practically impossible?—Yes; I simply said that to show how very impossible it would be.

14,702. (*Sir Charles Dalrymple.*) You spoke of the success of isolation; is the death-rate in Leicester especially low?—I have not studied that.

14,703. Is not that a matter of very great interest as bearing upon the question of isolation?—I daresay it is, but I do not profess to have studied the whole question. I only know that we do practise isolation to such an extent that within a very few hours if any case of small-pox is brought into the town (I am told, and I believe it is so, we never rear it) any person so affected, though a perfect stranger, is taken away, isolated, cured, and sent away about his business.

14,704. (*Mr. Hutchinson.*) Do you think there is any medical man with children who has not his own children vaccinated?—I do not know.

14,705. As far as your knowledge goes all medical men have their children vaccinated?—I have no knowledge as to their vaccination.

14,706. What do you think?—I never asked them.

14,707. As far as you know medical men never omit to have their children vaccinated?—I have never inquired, and it has not occurred to me.

14,708. Do not you think they would be the parties most likely to do what is best in their own interest and that of their families?—I have known doctors within the last few years who have differed entirely upon the subject.

14,709. Still, as far as you know, all the doctors of Leicester have their children vaccinated?—I cannot say that, because I do not know anything about it.

"were bad in the town I should advise you to have it done." From this statement I gathered that the doctor believed in vaccination as a protection against small-pox, but that he thought some serious risks attended the operation. I resolved, therefore, to make further inquiries both as to its advantages and dangers. Shortly after this I consulted another medical man in Southampton. He told me that he believed in the protective power of vaccination, but thought that sufficient was not allowed for the injuries which may ensue from it. He confessed that to his mind the matter was still an open question. I consulted several other medical men, some of whom were in favour and others against vaccination, and I read all I could on both sides of the question, and I soon had exceptional opportunities for studying the subject. About this time, in the year 1871, Southampton was visited by a very severe epidemic of small-pox. This gave me many opportunities for judging of the protective power of vaccination, and for inquiry as to those who were vaccinated whether they sustained any injurious effects from the operation or not. The disease was all round me. A case of small-pox occurred in a house opposite to that in which my unvaccinated child was living, but he was not attacked. I had 11 cases of small-pox among the members of my own congregation. They all recovered, and I made careful inquiry as to the particulars of vaccination in each case. From notes which I took at the time I obtained the following



results. That out of 11 cases of small-pox nine had been vaccinated and two had not been vaccinated, of the nine one had been vaccinated three times, and one had had small-pox before. The two that had not been vaccinated recovered in a very short time, and without a mark left by the disease. They both had the disease very lightly. One of them, who was about 52 years of age, thought he was inoculated in childhood with variolous matter, but was not sure.

14,714. Do you know what was the age of the unvaccinated person who had the small-pox?—I should think he would be about 22 perhaps.

14,715. Were the nine all adults?—No, there were some of them children.

14,716. Can you form any idea what proportion of your congregation would have been vaccinated?—No, I could not say that, but I should think at that time there would have been very few who were not vaccinated.

14,717. (*Mr. Meadows White.*) What would you take to be the number of your congregation at the time?—It was not large; an average congregation of 300, or a little more perhaps.

14,718. (*Dr. Bristowe.*) Some of those who had small-pox were, I presume, members of the families of some of your congregation?—They were.

14,719. Not attendants?—They were all connected with the congregation.

14,720. But they did not all attend your church; some of them would have been young children, I take it?—I think they were all old enough to attend.

14,721. (*Chairman.*) Will you continue your statement?—Taking my experience altogether during that epidemic, I found nothing to prove the protective power of vaccination. I had every reason to suppose that what I found in my own congregation was a fair sample of what existed in the town generally. At this time many cases of alleged injury from vaccination came under my notice, some of them cases of great suffering. In one or two instances I was required to bury children whose parents believed, rightly or wrongly, that they had lost their children through vaccination. One of these children I saw dying, and had no reasonable ground to doubt that the mother was right in the judgment she had formed as to the cause of death.

14,722. What do you think the cause of death was in that case?—She stated that it was the result of vaccination.

14,723. But producing what disease or complaint?—I could not say what the disease was; there was a severe swelling of the arm, which was very terrible to look at. On one occasion when I was before the magistrates in Southampton a young man arose in court and asked to be allowed to pay my fine of 20s. and costs, because, to use his own words, he had had "one child murdered by vaccination." I afterwards got a certificate of his child's death, and beg to submit a copy obtained from the registrar of the district. The certified cause of death is "Erysipelas following vaccination." The result of my inquiries during that epidemic was the firm conviction that vaccination was useless as a preventative of small-pox, and that it was often followed by serious consequences to the person vaccinated; and I resolved that no penalty or imprisonment should ever induce me to take the responsibility of submitting my children to vaccination. I believe this is the conviction to which a very large number of persons in this country have arrived from an experience more or less similar to my own.

14,724. (*Mr. Hutchinson.*) You say that you formed the opinion that vaccination was useless; on what grounds did you come to that conclusion?—From the fact that such a large number of persons coming under my own experience had small-pox after vaccination.

14,725. Do I understand that 11 out of a congregation of 300 had it?—Eleven.

14,726. Do you think that that is a large proportion?—I should have thought so.

14,727. They all recovered, did they not?—Yes, they all recovered.

14,728. (*Chairman.*) The two out of the unvaccinated section of your congregation would be, probably, a much larger proportion than the nine out of the vaccinated section, would it not?—I should say that.

14,729. (*Mr. Meadows White.*) Do you know whether there was a Vaccination Officer appointed in Southampton at the time?—I was living in the district, not in Southampton itself; there was a Vaccination Officer for the district.

14,730. (*Sir James Paget.*) Did you at all inquire into what number of your congregation had not been vaccinated?—No.

14,731. You assumed that a very large proportion had been vaccinated?—I should assume that.

14,732. Without knowing what proportion had not been vaccinated, why would you think that the two was a greater proportion than the nine?—I do not quite understand the question.

14,733. You say you think that the vaccinated were a very large proportion of your congregation: would two cases in the unvaccinated imply a less proportion or a larger proportion than the nine amongst the vaccinated?—I have no means of knowing what the proportion of the unvaccinated would be, therefore it would be difficult for me to answer that question.

14,734. (*Chairman.*) Were a number of people vaccinated at that time in consequence of the prevalence of the epidemic?—Yes, very shortly after this time a large number of persons were.

14,735. None of them prior to the time of this epidemic?—Yes, a very large number of persons were vaccinated at the time of the epidemic, or just about that time.

14,736. So that the question of the number of vaccinated would not depend merely upon the number who had been vaccinated in infancy, because a certain number would be vaccinated at a more advanced age owing to the prevalence of the epidemic?—It might be so.

14,737. (*Mr. Picton.*) You mentioned that one member of your congregation who had small-pox had been vaccinated three times?—Yes.

14,738. Do you remember what length of time elapsed after the last vaccination before that person took the small-pox?—I do not know that; I could not say.

14,739. Do you remember the age of the person?—The age of the person (it was a female) would be, perhaps, 35 or 36.

14,740. Then not many years would have elapsed after the last vaccination?—I should say not.

14,741. There were others who had been vaccinated more than once?—Yes.

14,742. Your impression was that the vaccination simply made no difference?—My impression was that it was not a protection from small-pox.

14,743. So far as protection from small-pox was concerned, it was a matter of indifference whether the people were vaccinated or not?—I had nothing to show that it made any difference, so far as I could discover.

14,744. You did not mean to say it would attract or facilitate small-pox?—Not at all.

14,745. (*Mr. Meadows White.*) You stated that one of your congregation who was attacked had previously had the small-pox?—Yes; nine had been vaccinated who afterwards had small-pox.

14,746. (*Dr. Collins.*) How long have you been in Leicester?—15 years.

14,747. You were prosecuted five times for the same child in Southampton?—Yes, I was.

14,748. Have you been prosecuted in Leicester?—Yes, twice.

14,749. How long is it since your last prosecution in Leicester?—That was on the 26th of March 1884.

14,750. Do you happen to know whether they continued to prosecute in Southampton?—I do not know that.

14,751. (*Sir Edwin Galsworthy.*) What were the results of those prosecutions in Southampton?—I was fined 20s. and costs.

14,752. In each case?—In each case.

14,753. (*Dr. Bristowe.*) One of your objections to vaccination is that it inflicts injury upon the vaccinated, is it not?—It is.

14,754. But you do not seem to have had much experience, do you, of injuries inflicted in this way. You quote two cases as I understand, one of them hearsay

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and the other the statement in court?—I have not evidence which I could bring before the Commission. I saw a great deal, but I did not take notes at the time which would justify me in presenting a statement.

14,755. You quoted two cases which do not go for very much; one of them was the statement of a young man who got up in court and offered to pay your fine; that was one of your cases; you do not know anything of that case really, it was a mere statement he made to you?—I have the certificate which gives “erysipelas following vaccination”; the person was known individually to me.

14,756. My question is directed to find out what your personal experience or personal knowledge of the injury inflicted was?—I saw a large number of children suffering whose parents believed, rightly or wrongly, that they

were suffering in consequence of vaccination, though I have not particulars such as I could bring before this Commission.

14,757. What do you mean by a large number; could you give any notion; how many would you say roughly?—It is 19 years ago, and it is rather difficult to recall the facts definitely. I could not say how many I saw.

14,758. Did you have medical opinions on those cases to which you refer, or did you only take the statements of the parents?—I took the statements of the parents, except in this case of the certificate.

14,759. Was the statement you have read to us prepared long ago, or was it prepared with a view to coming before the Commission from your recollection?—It is prepared from notes that I took during this epidemic in Southampton of 1871.

The witness withdrew.

Mr.  
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Mr. JOHN THOMAS BIGGS further examined.

14,760. (*Chairman.*) What is the next point to which you wish to direct the attention of the Commission?—I should like to refer first to some questions that were addressed to me by Mr. Whitbread respecting erysipelas. I promised to look that up for this week. In the first place, I took from the Medical Officer's reports all the information we could get from them. I have tabulated the information, and I will hand that table in; it covers 16 years. (*The table was handed in. See Appendix III., Table 2; page 416.*) I ought to explain that we can only go back 16 years in the way that your Lordship suggested, and the results of my investigation into the Medical Officer's reports are tabulated in this table from 1874 to 1889. The fall in deaths under 1 year of age is from an average of 19·3 in the first four years to 4·7 in the last four years.

14,761. 19·3 per what?—Per 10,000 births per annum. We took it at the rate of 10,000, because the figures are so very small. Then of children under five years per 100,000 living at that age there is a fall from 64·0 to 12·6.

14,762. You mean that that is taken upon a different basis from the first one?—The first is taken upon births and the others are taken upon population. I suppose it would not be right to take it upon the births for five years. Then for all ages taken at per 100,000 of the population the fall is from 21·0 to 5·2.

14,763. Is that of deaths?—Yes, the principal part of that fall is accounted for by the decrease under one year, which is from 19·3 to 4·7, a difference of 15; the difference in the death-rate at all ages is from 21·0 to 5·2, also a decrease of about 15.

14,764. What number of deaths are those taken upon, the number is very small?—The number of deaths is very limited. I can give you the totals for each year at all ages. For the year 1869 there were 12, and for each of the years following in the following order: 10, 11, 14, 10, 31, 26, 13, 11, 9, 4, 11, 10, 10, 6, 15, 7, 5, 10, 8, and 7 for 1889.

14,765. There is an increase of population?—Yes, there is an increase of population. We take from 1869 to 1889.

14,766. But in the last few years there does not seem to have been much variation?—Not much, but the fall is great considering the increase of population.

14,767. Under one year have you got the figures?—We are unable to trace those further back than 1874 without searching the registers; that point I will refer to presently. In 1874 there were 11 deaths; in 1875 there were 8 deaths; in 1876 there were 10 deaths; in 1877 there were 6; in 1878, 4; in 1879 there was 1 death; in 1880 there were 4; in 1881, 6; in 1882 there were 2; in 1883 there were 5; in 1884 there were 10; in 1885 there was 1; in 1886 there were 2; in 1887 there were 3; in 1888 there were 3; and in 1889 there was 1 death. There is a considerable variation; the year 1884 is a very high year. The death-rate is also rather high for that year from other causes. Those are taken upon the basis suggested by your Lordship that we should take the deaths upon the total population. Then, in regard to the inquiry, which was made by Mr. Whitbread as to tracing the deaths of the children and ascertaining how soon after vaccination they died and were registered as dying from erysipelas, I asked the clerk to the Guardians

to go through one year and furnish me with the results. He has done so, and finds that for that year, 1875, there were seven deaths; but in the Medical Officer's report there are eight deaths for that year, so I think he must have missed one. The result of the seven deaths is this, that three of the children died unvaccinated, and four of them died within about a month after vaccination. Joseph H. Dunkley, of 6, Underhill Street, died unvaccinated on 27th February 1875. I might mention that the registrar has not furnished me with the date of their birth. Alexander Gee, 64, Russell Street, vaccinated 1st September 1875, died 19th September 1875.

14,768. (*Sir Edwin Galsworthy.*) Is not the age given at death?—They are all under one year. This was a search made by the clerk simply to test what sort of a task it would be to obtain the results asked for by Mr. Whitbread. Mary Stevenson, 174, Curzon Street, vaccinated 8th September 1875, died 17th October 1875. Annie Garner, 18, Gray Street, vaccinated 30th December 1874, died 5th February 1875. John Baker, 10½, Highercross Street, unvaccinated, died 27th September 1875. Sarah E. Turner, New Park Street, vaccinated 26th October 1875, died 27th November 1875. Joseph W. Shaw, 48, Andrew Street, unvaccinated, died 3rd December 1875.

14,769. (*Chairman.*) You would not, I suppose, draw any decided conclusion from that?—Not from this one year's return, because it is obvious that the other death, which this return does not include, might make a considerable difference in the calculations, and, as I intimated before, it is rather unwise I think to endeavour to draw any special conclusions from small numbers and limited periods.

14,770. (*Dr. Collins.*) It would be true to say, would it not, of this year 1875 that of the four vaccinated children who died of erysipelas every one died of that disease from three to six weeks after vaccination?—That is so; one of them in 18 days and one within about a month. The others are 37 days and 39 days respectively. This return was prepared by the registrar, in order to ascertain if it would be possible to follow up the suggestion made by Mr. Whitbread. I asked him if he would furnish me with a return estimating what it would cost to get out the return, because it would involve a lot of labour. He addressed this letter to me, dated the 9th of March: “Referring to our conversation of Thursday last, it would be possible to prepare a return of children who have died from erysipelas in each year from 1868 to 1890, and in most cases to trace whether they were vaccinated or not. It would, however, involve an immense amount of labour, and I feel sure that the Guardians would not be prepared to pay for it. If there is any other source from which the expenses could be paid I shall be glad to furnish the return. I have taken one year, and I estimate the cost of the return at 20l. Yours truly, LIONEL P. CHAMBERLAIN.”

14,771. (*Chairman.*) Have you formed any idea what proportion of the children under one year in any given year, say the year 1875, would be vaccinated, and what proportion unvaccinated?—It is given in the table; in the four years from 1874 to 1877 the per-centage of vaccinations to births is 79·4.

14,772. If you have 79 per cent. vaccinated and only 21 per cent. unvaccinated, the three cases of death



amongst the unvaccinated are really a very considerably larger proportion than the four deaths amongst the vaccinated; would that not be so?—I do not think it would be fair to infer that, because we do not say that because children are unvaccinated they cannot necessarily die from erysipelas.

14,773. That is not the point; when the question is whether vaccination is the cause of the erysipelas, which is the suggestion, it is a material matter, is it not, to consider whether in those young children a larger proportion of vaccinated children had erysipelas than of unvaccinated children?—That is a material point; but there is another way to look even at that question. In all probability, in fact we find from this investigation of the registrar that three children who were unvaccinated did die from erysipelas. Of course, we must say that they would have died if there had been no vaccination at all in Leicester. Then the question arises as to whether the other four would have died at all if they had not been vaccinated. This seems to be the question that presents itself to my mind.

14,774. Of course I do not suggest that it follows at all because three died unvaccinated from erysipelas that the vaccination was necessarily unconnected with the erysipelas in the case of the four who died of erysipelas being vaccinated; but is not one of the elements you would look at this: whether if vaccination be a serious cause of erysipelas you would not expect to find the greater proportion of erysipelas deaths amongst the vaccinated children than amongst the unvaccinated children, is not that one of the elements you would have to consider; I do not say the only element?—We should have to consider that, but there are many other elements to bear in mind. For example, we find in many instances where it is alleged that the child had died from vaccination the cause of death is not registered as “erysipelas” but “convulsions,” “bronchitis,” and a host of other causes.

14,775. (*Sir William Savory.*) How do you show that?—I propose to show that presently. I shall be able to show proof of it in another table of injuries and deaths.

14,776. (*Chairman.*) I do not see the bearing of that on the question I was putting—that may be of importance when you come to the question of whether those other things are stated to be the cause of death when vaccination really was; but I do not see how that touches the question of erysipelas?—It may not touch the question of erysipelas itself, but I think it is a matter we should bear in mind when considering the question of the mortality from erysipelas, because it would be very unwise to assume that erysipelas was the only disease from which children die following vaccination.

14,777. I did not suppose that anybody was assuming that; no question that I put suggested that, did it?—Not at all.

14,778. At the same time, if you are to be accurate in a statistical inquiry, although you may compare the results afterwards, you must deal with one thing at a time?—That is true. What I wished to avoid was the inference that the deaths of the unvaccinated from erysipelas necessarily arose because the children were unvaccinated.

14,779. This is quite clear, is it not: that erysipelas is a disease which attacks young children, and which causes their death quite apart from the operation of vaccination?—Yes.

14,780. (*Mr. Meadows White.*) Have you compared the statistics of deaths in Leicester with those of any other places?—I have not. I prepared this return as I promised last week to see what could be done; of course I should be pleased now to make the calculations that have been suggested, but it would be a very heavy task to go through the registers. I certainly could not undertake to do that on my own account; if the figures were furnished to me by the registrar I should be pleased to deal with them.

14,781. (*Dr. Collins.*) Mr. Whitbread pointed out that in the years between 1874 and 1877 the per-centage of vaccinations to births is given as 79·4; that figure relates I apprehend to the total number of births which took place in the preceding year. The figures I think you told us some time back were sometimes made up a considerable period after the termination of the year?—Yes; a period of six months at least.

14,782. So that it might perfectly well happen that the proportion of children under one year vaccinated

to unvaccinated was very much less at six months than it was at nine months or twelve months?—That is so.

14,783. (*Sir William Savory.*) There is nothing to show that?—The returns presented by the Guardians to the Local Government Board show that.

14,784. (*Chairman.*) Show what?—The point now raised by Dr. Collins, I take it, is this: that after six months of a year have elapsed there are a smaller number vaccinated than when nine months have elapsed of the children born even in the first six months, and that when 12 months have elapsed the proportion vaccinated is still larger. Assuming that 4,000 children were born in 1875, and 3,000 of them had been vaccinated by the 31st of December, by the 30th of June following a larger number still would have been vaccinated, and that return ending June would be furnished to the Local Government Board.

14,785. But what number are vaccinated during the year of birth you do not know?—That is the point; the returns to the Local Government Board are constantly supplemented by a subsequent return; the final return, which is printed, and has been handed in, is for six months after the termination of the year. This return, which I have put in to-day, shows in regard to vaccinations on the same basis the average per-centage of vaccinations to births for each of the four years, they fall from 79·4 in the first period to 10·8 in the last period.

14,786. (*Mr. Whitbread.*) I would ask you whether the annual report of the Medical Officer of Health does not show that in the reported cases, not deaths but reported cases, of erysipelas in the years 1880–89 there has been upon the whole a very steady decrease in the number of cases reported running parallel with a very great decrease in the number of children vaccinated?—There is a considerable decline, no doubt, since 1881, which gives 566 as the number of cases reported of erysipelas, and for 1889 only 219.

14,787. (*Dr. Bristowe.*) But those are cases amongst the general population, are they not—not amongst the children only?—They would be amongst the total population.

14,788. (*Mr. Whitbread.*) But of the total population in 1889 there must have been a very largely increased number of unvaccinated beyond what there was at the beginning of the decade?—There is no doubt as to that; scarcely any vaccinations are carried out now, only about 130 a year.

14,789. (*Mr. Hutchinson.*) Mr. Whitbread's question was, I think, to this effect: that the number of erysipelas cases reported is steadily diminishing?—That is so.

14,790. Do you know whether there is a general disinclination on the part of medical men to regard erysipelas as a disease needing to be reported?—I do not think there is any general disposition of that kind.

14,791. (*Chairman.*) But you told us that you had been rather trying to keep down the reporting of it?—I was going to refer to that.

14,792. (*Mr. Hutchinson.*) Your Medical Officer thought it somewhat needlessly included in the list of diseases requiring to be notified, and there are many medical men who think so?—Our Medical Officer thinks so.

14,793. (*Mr. Whitbread.*) To clear up that column, what does the word “reported” mean there; does it mean that every case that is reported to arise is included there?—Yes; as I intimated last week, I mentioned to the sanitary committee that question of the disallowance of fees. Unfortunately the Medical Officer was in London in connexion with the Leicester Extension Bill and was not there to answer the question; but I consulted one of the clerks in the office, and he told me that some time ago there was a good deal of dispute (before the present Medical Officer was appointed) in regard to those trivial cases of erysipelas, and that since that time there has been a decline in the number of notifications, which would probably account for some part of that difference; but there is a general decline, no doubt, apart from that. Then as to the question of these fees not being paid, I followed that point up as closely as I could. I was under the impression that some of them had been struck out without payment of the fee to the medical man notifying; I find that has only been so in very rare cases; and I have tried to find out in how many. The general impression at the sanitary com-

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mittee, even of the chairman to whom I mentioned the matter last Friday, was that they were actually struck out; but as was stated here the Medical Officer has no power to strike them out; and I do not think that the attempt has been made for some years past.

14,794. (*Dr. Collins.*) The medical man who neglected to notify a case of erysipelas, if he really believed it to be one, would be liable to a penalty, would he not, under the Act of 1888?—He would, and to a 10*l.* penalty in our local Act of 1879.

14,795. (*Chairman.*) Does that conclude your remarks as to the tables you are putting in with regard to erysipelas?—That concludes what I have to say as to the local table. I do not know whether the Commission would wish me to go into the question of how far I should follow out the proportion of vaccinations to deaths from erysipelas.

14,796. The Commission will consider that point?—Following up this inquiry with regard to erysipelas I have prepared a table of deaths from erysipelas, following vaccination, extracted from the annual returns of the Registrar-General from 1859 to 1889, and taking the first period when vaccination was obligatory, from 1859 to 1867, a period of nine years, I find that the following deaths were certified as occurring from erysipelas after vaccination: in 1859 there were five deaths; in 1860 there were three deaths; in 1861 there were two; in 1862 there were three; in 1863 there were 11; in 1864 there were 13; in 1865 there were 10; in 1866 there were 10; and in 1867 there were four deaths. Those figures give an annual average of 6·8; the total number of deaths during those nine years was 61. Then the Act of 1867 came into operation; and taking the four years, 1868 to 1871 inclusive, in 1868 we have nine deaths returned as occurring from erysipelas after vaccination; in 1869 there were 19; in 1870 there were 20; and in 1871 there were 24; being a total of 72 for the four years after vaccination was enforced by penalties under the Act of 1867. The annual average deaths for those four years rises from 6·8 in the first period to 18·0 in the second. Then I take a period of nine years, from 1872 to 1880 inclusive, during which years the certificates were still filled in as deaths “from erysipelas after vaccination,” and I find that the following numbers were returned: for 1872 the number was 16; for 1873 it was 19; for 1874 it was 29; for 1875 it was 37; for 1876 it was 21; for 1877 it was 29; for 1878 it was 35; for 1879 it was 32; and for 1880 it was 39; being an annual average of 28·5, and the total number of deaths during those nine years being 257. At that time the nomenclature was altered; the deaths were then registered as occurring from “cow-pox and other effects of vaccination.” I have taken another nine years, from 1881 to 1889 inclusive, and the deaths during this fourth period appear as follows: in 1881 they were 58; in 1882 they were 65; in 1883 they were 55; in 1884 they were 53; in 1885 they were 52; in 1886 they were 45; in 1887 they were 45; in 1888 they were 45; and in 1889 they were 58; giving an annual average of 53, and the total number of deaths during the nine years was 476. (*The table was handed in. See Appendix III., Table 3; page 416.*) Here we have got a total number of 866 deaths certified by medical men as occurring from “erysipelas after vaccination” and from “cow-pox and other effects of vaccination.” The annual average rises from 6·8 in the first period when vaccination is obligatory to 18·0 in the second period when it is enforced by penalties; and from 18·0 to 28·5 after the Act of 1871 came into operation, when we may take it that vaccination was more rigorously enforced. In the last period, when vaccination was still as rigorously enforced, but when the nomenclature was altered to “cow-pox and other effects of vaccination,” which would probably give a wider range for medical men to certify deaths under, we find that the rise is from 28·5 to 53·0.

14,797. But you are now dealing with deaths after vaccination, from whatever cause?—From erysipelas after vaccination.

14,798. But I thought the last list you read to the Commission was from “cow-pox and other effects”?—Yes, having first taken the heading “erysipelas after vaccination.”

14,799. “Cow-pox and other effects” is a broader heading, is it not, than that of “erysipelas after vaccination”?—I have just stated that it is a broader heading, but still it would embrace those previously returned.

14,800. Still you could not compare the two for the purpose of judging whether or not there was an increase

in the number of deaths from erysipelas?—Not as an increase from erysipelas alone, but as an increase from other causes, such as cow-pox and other effects of vaccination; from the effects of vaccination practically.

14,801. I understand you were dealing only with erysipelas?—I stated that I would deal with a table which would lead us up to a point where we cannot deal with erysipelas only, and I find that by this table we have 866 deaths shown as having occurred after vaccination, which practically to all intents and purposes, as far as I understand, are ascribed to vaccination.

14,802. (*Dr. Collins.*) There would be no material in the Registrar-General's returns since 1881 for getting out the deaths from erysipelas after vaccination by themselves?—They are now grouped under the heading “Cow-pox and other effects of vaccination.”

14,803. (*Mr. Picton.*) Previously to that no other effect but that of “erysipelas following vaccination” was noticed in the Registrar-General's returns?—I believe not.

14,804. (*Sir James Paget.*) Have you the number of persons vaccinated in each of those years?—I have not with me.

14,805. (*Dr. Bristowe.*) Is it one of your points to show that deaths from vaccination have increased of late?—I think this table shows that; since vaccination was more rigorously enforced.

14,806. But you have not had regard there to the relative populations which existed in England in the early periods and the later?—In Table 3, I have made no reference to population at all; but taking the percentage of increase, which would probably meet the point you now raise, I find the increase in the average annual deaths from the period 1859–67 to the period 1868–71 is 264 per cent., taken upon the average annual number, that is to say, a rise from 6·8 to 18·0, which represents a rise of 264 per cent.

14,807. On what?—On the average annual death-rate. Then from the second period to the third we get an increase at the rate of 158 per cent.; and from the third to the fourth period we get a rise of 185 per cent., and from the first to the fourth period it shows a rise of 779 per cent. I should judge, if those returns are comparable one period with another, that this would represent a per-centage more than equivalent to the increase in the population.

14,808. Would that not be due to the fact that the Local Government Board had enjoined upon those who made the returns the duty of indicating it in the certificates when the death has followed “after vaccination”?—I do not know that any special request has been made to that effect; the only knowledge I have of anything of that kind is with regard to the several official inquiries which have been made as at New Humberstone, where Dr. Ballard blamed the medical man, Dr. Nuttall, for not having named vaccination upon the certificate. Apart from that I know nothing of any instructions. I put Table 3 in to show that there are 866 deaths which do not rest upon the allegation that the medical men were warned at all, but which have been returned by medical men all over the country as occurring in one way or another from the effects of vaccination.

14,809. (*Mr. Hutchinson.*) What district exactly does that cover?—This table is for England and Wales, I believe. I do not apprehend that any exception will be taken to this return. I have here three certificates which have been forwarded to me from Henstead, in Norfolk. In each case the parent asserts that the death was the result of vaccination; but in those certificates no mention whatever is made of it; each death is certified by a different medical man. There is one certificate of William Walter Blake, certified by G. Blake Masson, M.R.C.S. Cause of death “convulsions, two days”; then this is another, namely, Charles William Whiting, cause of death “pyæmia, four days,” certified by Frederick J. Oxley, M.R.C.S.; another is that of Robert James Smith, cause of death “asthenia: tabes mesenterica, two months,” certified by A. George Goldney, M.R.C.S.

14,810. (*Chairman.*) Your only knowledge of the facts is that the parents say that vaccination is the cause?—That is all I know of those cases.

14,811. You would hardly accept that, would you, as sufficient proof in a case of this description?—I should like to make further investigation into them; but since I was here on the last occasion I addressed a letter or two, and there is one reply that I should like to read.



14,812. Who is it from?—This letter was written by Mr. Henry Robinson, of Cleckheaton, in answer to a letter of mine.

14,813. Was yours a circular letter?—It was a circular letter.

14,814. Addressed to whom?—It was addressed to a number of men in the country who are connected with the anti-vaccination movement. I wanted to ascertain from them whether recently they had had any cases in their immediate neighbourhood where deaths had been certified as from or following vaccination. I should like to read these two letters, because they seem to represent to my mind what I believe is a widespread feeling, and it also opens up, or is a further testimony in regard to, the subjects we were discussing on a previous occasion. Mr. Robinson states: "I know a number of parents who are quite sure that vaccination was the cause of their child's death, but the certified cause of death was erysipelas or other blood disorder. We have also here a number of children who are permanently injured by vaccination in this district." Then there is another one that I should like to read an extract from, written by Mr. Arthur Stubbs, of Ashton-under-Lyne. He says: "We have not been able to get any death certified as being due to vaccination in the Ashton-under-Lyne district on account of the general desire of the doctors and Coroner to shield vaccination from reproach. A short time ago a child died in Ashton some 10 or 12 days after vaccination, and we investigated the case and felt certain that vaccination was the cause of death, the mother being quite convinced of it, but an inquest was held and the verdict was 'died by natural causes.'" I refer to these letters to show that there is a feeling in the mind of a great number of people that there is extreme difficulty in obtaining a certificate of death "from vaccination" when that is believed to be the cause of death.

14,815. (*Dr. Collins.*) Were those two cases of Blake and Whiting, of which you read the certificates, part of a series investigated by Dr. Barlow and by Dr. Thompson a short time ago?—I believe they were, but I do not think the report has been issued yet. A private inquiry has also been made.

14,816. I find the report is to this effect: "It appears to me that it is obvious that some septic material has been introduced"?—That I have not seen.

14,817. (*Chairman.*) What is the next point to which you desire to call the attention of the Commission?—I thought while we were upon the question of death certificates it would be as well to thoroughly thresh that point out. It is possible that this information has been brought before the Commission, but I will just refer to it now. There was an examination made in 1876 by Mr. J. Netten Radcliffe "on Certain Cases of Erysipelas, following upon Vaccination, in the Misterton district of the Gainsborough Union, Lincolnshire, and in adjoining districts of the same Union and of the East Retford Union." (*See Appendix IV., page 466.*) In that case the investigation was first carried out by Mr. Mawer, a Guardian, and laid before the Gainsborough Board of Guardians in the month of November 1876. He says: "We have had six deaths which are certified as those of children dying from various causes, and in each one of them no mention is made of vaccination; but I believe that when a recent investigation took place the whole of those deaths were shown to be connected with vaccination, and that practically vaccination was the cause of the whole of those deaths." I wanted also to refer to them because of the one point that was raised in regard to the practice of Public Vaccinators in carrying out their operations. I stated that I believed that in many instances they did not adhere to the regulations that were laid down, and I think that this will be found to be the case from this report by Mr. Radcliffe. On the first page of this report I find this observation: "The inquiry as to these cases has been one of considerable difficulty. The register of public vaccination has not been kept

"in a manner to be relied on, and Dr. Wright has no record of the events about to be described. He has, however, willingly given such help as he could from memory, but his memory of the different occurrences is very imperfect."

14,818. (*Mr. Meadows White.*) What is the date of that?—The date of the report is 16th December 1876.

14,819. (*Dr. Collins.*) Would you kindly read the causes of death as certified in those various cases?—The cause of death in the case of Joseph Henderson is certified as being "erysipelas, six days," and the statement is that the erysipelas began on the vaccinated arm. In the case of Edwin George Baker the certificate states the cause of death to be "retention of urine, diffuse inflammation of kidneys, bladder, and scrotum;" in that case the erysipelas began on the vaccinated arm. In the case of Mary Cottam the certificate of the cause of death is "pyæmia." In the case of Charles Cooper Parker the certificate of death is "pneumonia, three days." In the instance of John George Woodhouse the cause of death was certified to be "inflammation of thorax and arm, ten days." In the case of Alice Laura Scott the cause of death is given as "scarlatina, erysipelas, three weeks." In all those cases, excepting one, erysipelas began on the vaccinated arm, and in that one exceptional case of John George Woodhouse there was a swelling in the arm-pit of the vaccinated arm.

14,820. Were they all certified by the same doctor?—The cause of death in Henderson's case was certified by Dr. Wright, the vaccinator. The next one, Baker's, was certified also by Dr. Wright. Mary Cottam's certificate of death was given by Dr. Crowden; Parker's case was certified by Dr. Wright. They are all but one certified by Dr. Wright.

14,821. (*Mr. Meadows White.*) Does the report state whether Dr. Wright said that he believed the deaths were caused by vaccination, although he certified in the way that he did?—No; the report in regard to one particular case blames Dr. Wright very much for the manner in which he carried out the operations; but I am not sure whether it states that which you ask me.

14,822. It does not say what Dr. Wright said upon that matter, as to his own personal belief whether the deaths were to be attributed to vaccination or not?—No. Dr. Wright attended five out of the six cases, and therefore had full knowledge of the events throughout. I believe in regard to two of the cases he was extremely anxious respecting them, and saw the child and the parents frequently. However, the practical conclusion of this report is, that a large number of vaccinations were carried out. We have a summary of 16 cases that were vaccinated in this series, and out of that number there were 11 cases of erysipelas. Erysipelas appeared upon the sixth day in one case; upon the eighth in two cases; upon the ninth day in one case; upon the eleventh in two; on the thirteenth in one; on the eighteenth in one; on the twenty-sixth in one; on the twenty-seventh in one; and on the twenty-ninth in one case. I have read this report through and I find in regard to one of the operations, that on Edwin George Baker, the report states that "the operation was performed at the child's own home, and, according to the mother, it was effected by scarification in four places with a lancet, no point being used, whence she inferred that the lymph was carried upon the lancet. Dr. Wright is unable to say positively whether this was the case or not, but he states that it is a very rare exception indeed for him to use lymph carried on the point of a lancet", showing that it was at all events, occasionally the practice of Dr. Wright to do that. He is afterwards blamed with respect to that.

14,823. We shall get that from the report itself?—Yes. What I wanted to point out was that in the whole of these cases the Public Vaccinator is blamed for not having adhered strictly to the regulations laid down. When I mentioned that fact before some exception was taken to it; but I think it will be found to be much more a general practice than is usually supposed.

<sup>1</sup> Mr.  
J. T. Biggs.  
11 Mar. 1891.

Adjourned till Wednesday next at 1 o'clock.



## Sixtieth Day.

Wednesday, 18th March 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir CHARLES DALRYMPLE, Bart., M.P.  
 Sir W. GUYER HUNTER, K.C.M.G., M.P.  
 Sir EDWIN HENRY GALSORTHY,  
 Sir WILLIAM SAVORY, Bart.  
 Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
 Professor MICHAEL FOSTER.  
 Mr. JONATHAN HUTCHINSON.  
 Mr. J. ALLANSON PICTON, M.P.  
 Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary*.

Mr. J. H.  
 Neale, M.B.,  
 M.R.C.P.

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Mr. JOHN HEADLEY NEALE, M.B., M.R.C.P., examined.

14,824. (*Chairman*.) You are a Doctor of Medicine, I believe?—I am Bachelor of Medicine and Master in Surgery.

14,825. Are you one of the physicians to the Leicester Infirmary?—I am at the present time; I was formerly assistant physician.

14,826. Were you assistant physician in the year 1887?—I was.

14,827. Do you remember a child named Hart being brought to the Infirmary?—I remember the occurrence perfectly well now that it has been recalled to my memory by the evidence, a slip of which was sent to me by the Secretary to the Commission.

14,828. Have you any record which would enable you to say when the child was brought to the Infirmary?—Yes, I have. If your Lordship will allow me, with the permission of the Commission, to make a brief statement and produce a few documents, I shall be able to show in order the facts of the case, and save the time of the Commission and my own. I have had a letter from Dr. Emms requesting me, if I could, to supply a certain paper in which a letter of mine appeared. It has been found impossible to get a copy of any paper in which that letter appeared, but I have gone to the reference department of the public library, and have obtained all that is necessary to submit to the Commission. I have before me Mrs. Hart's evidence, and, if you will kindly turn to the answer to Question 14,222, she says: "I took it to the Infirmary, where two doctors saw it, who told me that it was a very bad case of blood-poisoning, and that I should take it home at once or it would turn fatal. The child died directly after I had got home." Then I will ask the permission of the Commission to read a certified extract from the "Midland Free Press" of November 26th, 1887, bearing upon this subject. It is headed, "Release of Anti-Vaccinators," and it is as follows: "Mr. Ellmore said the three last-mentioned were the names of the men who had been released that morning, and the other who had only to do seven days was liberated on Tuesday morning. He thought it was only proper that they should publicly condemn the action of the Guardians of the Billesdon Union. (Applause.) He had gone the other day, in company with the chairman of the Leicester Board of Guardians, to see a child at Belgrave which had been vaccinated by Dr. Emms, the public vaccination officer, six weeks ago. The child was suffering in such a manner that it made him feel ill, and it would make anyone feel ill who witnessed it. There was an open sore at the place where it had been vaccinated sufficient to hold a large sized pea. He knew some people held that it was necessary to vaccinate in order to protect themselves from small-pox, but small-pox could never be worse, or make that child worse than it was. Dr. Emms pooh-poohed the idea that it was vaccination that did this, but there were several other children whom he had vaccinated about the same time who also suffered. The child had since been taken to the Infirmary and the doctors there said its ailments were the result of vaccination, and that it was suffering from blood-poisoning." That is certified by the assistant librarian as being a correct copy. Then in the "Midland Free Press" of the same date appeared this

letter: "The Vaccination Question: A Father's Complaint: Sir, I wish for a small space in your paper, being anxious to give a word of warning to parents intending to have their children vaccinated; I think after hearing the experience that we have met with, it will be a lesson, not only for myself but to others, to resist in spite of the action of the Barrow Guardians and the magistrates. If these individuals will pay a visit to my house and see the result of vaccination, if they have any conscience whatever they will relent their proceedings, and will justify my determination to resist any future operation in spite of either Boards of Guardians, magistrates, or jails. My child is ten months old, and owing to the pressure of circumstances, and being unable to endure imprisonment, I was obliged to have it vaccinated, and accordingly took it to the public vaccination station, at Belgrave, where it was operated on by Dr. Emms, now six weeks ago."—I particularly ask the attention of the Commission to that statement of fact that the child was vaccinated six weeks before its death.—"The child was a picture of health in every respect, rather small in stature, but well developed, and had not known a day's illness. For more than a month after the vaccination the marks never ceased discharging. A week after the operation the vaccinated arm began to swell and show strong symptoms of inflammation, and was covered with blisters which have extended all over the child's body and up to its eyes, which are so swollen and inflamed that we fear it will permanently lose its sight. It has every appearance of being blind now. Dr. Emms says this is water. It may be water, but anybody with common sense will know that it was caused through vaccination, this I am the more certain of, seeing that two other children living close to us were done with matter at the same time with more or less the same results. Both my child and my neighbour's, at the end of seven days began to swell up with water. The feet and hands were drawn together like birds' claws, and were perfectly stiff and unable to be moved for more than a week. The skin, not being sufficiently elastic to allow the water to rise, has burst in many parts, and the raw flesh is to be seen on all parts of the poor child's body. One of the marks on the child's arm, which has been done six weeks"—he repeats the statement—is sufficiently deep and large enough to allow a good-sized pea to go in it. If there should be any person who may read this letter and doubts the possibility of ill effects of vaccination, let them come and see my child. Every joint in the body is inflamed, and the skin is broken to such an extent that it is an awful sight to behold. The truth of my statement here can be endorsed, not only by my own friends, but by my neighbours, who are perfectly familiar with the whole history of the case. Both myself and wife are perfectly healthy, and we have had three children previously, which were vaccinated, but without ill-effects. Apologising for causing you so much trouble, Yours truly, T. HART, 22, Thurcaston Road, Belgrave. P.S.—Since writing the above, my wife has taken the child to the Infirmary, where its case received the fullest attention and inquiry, and the two doctors who examined it said it was a very bad case of blood-



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"poisoning, and thought it might prove fatal.—T. H. (We are informed that the child whose case is described in the above letter died on Thursday night.—Ed. M. F. P.)" That would be the night following the day upon which I saw it.

14,829. Is the letter dated?—The letter itself is not dated, but it appears in the issue of November 26th. This paper I have here is a certified office copy of a letter which I addressed to the "Leicester Journal" of December the 2nd; that is following the appearance of that paragraph and letter: "The Belgrave Vaccination Case. To the Editor of the Leicester Journal. Sir, In last week's 'Midland Free Press' appears a letter headed 'The Vaccination Question: A Father's Complaint,' signed by one, T. Hart, 22, Thureaston Road, Belgrave. It is not my intention to discuss the merits of the case; but simply to give an unqualified denial to the statement contained in the postscript, which ran as follows: 'Since writing the above, my wife has taken the child to the Infirmary, where its case received the fullest attention and inquiry, and the two doctors who examined it said it was a very bad attack of blood-poisoning, and thought it might prove fatal.' I have also to give unqualified denial to a still grosser misstatement uttered by one Mr. Ellmore, in a speech delivered by him on Friday last, anent the release of three anti-vaccinators from prison, to the effect that 'the child had since been taken to the Infirmary and the doctors there said its ailments were the result of vaccination, and that it was suffering from blood-poisoning.' I was the only qualified officer of the Infirmary who saw the child on the morning of the 23rd instant, and I neither made use of the term 'blood-poisoning' nor did I say that its ailments 'were the result of vaccination.' Yours faithfully, J. Headley Neale, M.B., &c., Assistant Physician to the Leicester Infirmary." Perhaps it would occupy too much time if I were to ask permission to read a letter which appeared in the "Leicester Daily Post" from one Amos Booth. I believe I never saw the letter until last night, when I discovered it in the reference department of the library. I was told by a friend that he had written to the newspaper, practically calling me a liar, but I treated it with a dignified silence, and I do not think to the best of my knowledge that I ever read the letter until last night; but as it contains some very incorrect statements I do not know whether I might not be allowed to read it.

14,830. Is it in relation to this case?—Yes, in reference to my alleged statement that the child was suffering from blood-poisoning.

14,831. You had better make your statement of what were the facts with regard to the case and what took place at the Infirmary, and if they are in conflict with any particular statement made in the letter you may refer to the letter and make such observations as you have to make with regard to it?—The whole thing did not occupy above five minutes upon the morning in question. The writer of this letter says: "In consequence advice was sought at the Infirmary, to which institution the mother, child, and neighbour went. This visit to the Infirmary has evidently produced a 'hornet's nest,' and it is this visit which has prompted the doctor to publish through the papers a blank denial of asserted conversation as alleged by the women, but denied by the doctor, as having taken place. Dr. Neale complains that he is accused by the postscript of Mrs. Hart's letter of having said that the child was suffering from blood-poisoning, and, also, that the statement was reiterated at a meeting outside the prison by Mr. Ellmore. The doctor, in his letter referring to the postscript, says he 'gives it an unqualified denial,' and he always uses the same expression of dissent in regard to the alleged remarks of Mr. Ellmore made at the release meeting. Now, I have had an interview with Mrs. Hart and also Mrs. Tomlinson, who accompanied her to the Infirmary, and was present when Dr. Neale and, we presume, his assistant inspected the now dead child's arm, and they both declare that Dr. Neale, in conversing with the assistant, said that 'it was a case of blood-poisoning.' Mrs. Tomlinson has visited the Infirmary since the little discussion took place, viz., last Wednesday, on her own account, and in reference to her own indisposition. She was then asked by Dr. Neale if she was not the woman who came there with Mrs. Hart. The answer was 'Yes.' The doctor then told her that he should deny through the press having ever said what he was accused of. This was after the publication of Mr. Hart's letter. This action

"on the part of Mr. Neale, in my opinion, did not improve his case, and it seems unreasonable to suppose these two women would leave the Infirmary with a lie on their tongues, or that they should get hold of the phrase 'blood-poisoning,' if it had not been used. After the interview already named, I went and saw Mrs. Pearson, whose child was vaccinated with matter taken from the same shilling as Mrs. Hart's, and she informed me that the child had been very ill since the operation. 'Its body was inflamed all over, and its limbs appeared to be paralysed for several days.' She said also that both her mother and herself had no doubt whatever that vaccination was the cause. This testimony speaks much, especially on account of its spontaneity. Before closing I should like to ask Dr. Neale whether he denies the accusation that the child of Mr. Hart was suffering from blood-poisoning?" Then he says, "An answer to this question," that is the question he propounds, "will have much more weight upon the public mind than the question as to whether he said it to the two Belgrave women or his assistant in their presence." What happened was this: that I went to the Infirmary on the morning of the 23rd November where, as I find by reference to my books, I saw the child in my private room lying in the lap of a woman and another woman bending over it, and my assistant bending over it too. I said, "What is this?" The woman began a long rambling statement about the child's illness and added something about its being due to vaccination, finishing up with "Please, Sir, is it blood-poisoning?" The way she fired that remark at me put me on the alert. I said to my assistant, as a sort of an aside, "You do not catch a weasel asleep," adding aloud to the woman, "Dirt poisoning more likely. Why have you allowed the child to get into such a filthy state?" You will note in the mother's evidence that she states that it had not been washed for a fortnight. It made my room positively stink. I said, "You had no business to bring it all the way from Belgrave in this state; the child will probably die before you get it home; take it away." After the correspondence ceased, the whole thing passed from my mind till last Sunday morning, when I received a notice from the Secretary to the Commission directing me to attend.

Then, in answer to Question 14,228 in reply to Mr. Hutchinson's question, "How long did it live after the operation?" Mrs. Hart says, "Just six weeks." Then, again, in reply to Dr. Collins' Question 14,247, "How long did the child live after the vaccination?" she replied, "Six weeks, but he," (speaking of Dr. Emms) "attended her for five weeks after she had been vaccinated." I have no wish to attribute *mala fides* to the witness, but, assuming that the child was vaccinated upon the last day of the month of June, and assuming she died six weeks after the operation, that would make the child's death take place upon the 11th August. I think you will find that to be correct, so after receiving the notice from the Secretary on Sunday, I went down and hunted out my old Infirmary case book and found that I saw the child alive on the 23rd November 1887. I have the entry: "Annie Hart, ten months; 22, Thureaston Road; Belgrave; Bright's disease." Whereas the child died, according to the mother, on the 11th August, six weeks after vaccination.

14,832. (Chairman.) She did not give the exact date of the vaccination; I think she said "in the following June"?—I have taken it as the 30th June.

14,833. But it is possible she may have made a mistake about her date of the vaccination. Not having the certificate of death at hand, and not knowing the date of the death, our attention was not called to it; but I suppose there would be a vaccination register showing the date of the vaccination?—Certainly; I think that would be rather an important document. I have looked up as much as I could in the short time which has been at my disposal.

14,834. (Sir Guyer Hunter.) In fact, the child died three months later than the supposed date given by the mother, and from a different disease entirely?—Yes, it was moribund when I saw it.

14,835. From what disease did it die?—Bright's disease.

14,836. There could be no confusion about that; it could not be another child?—No; there is the name and address in my own handwriting. I may say that I made one error arising out of the quick way in which the case was dealt with. I put down "acute"; I should have been more correct if I had said that it was "sub-acute."



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14,837. (*Chairman.*) Did you examine the child enough to enable you to say that?—From my knowledge I had no doubt in forming that diagnosis; it was not written down for any special purpose whatever.

14,838. (*Mr. Meadows White.*) The word “dropsy,” I think, was used in the certificate; might that have any connexion with Bright’s disease?—Dropsy is one of the symptoms of Bright’s disease; it may be also a symptom of other diseases.

14,839. (*Sir William Savory.*) Was that the only time you saw it?—Yes, and only then for about five minutes; the child was in a dying state. I had about 100 other patients to see, and I told the mother that we could do it no good; that she had no business to bring it out. I felt she had committed a great mistake in bringing the child up at all as an out-patient.

14,840. (*Mr. Meadows White.*) Was it suffering from dropsy when you saw it?—It was œdematous, as we call it, all over its body, swollen up beyond recognition.

14,841. (*Chairman.*) Did you examine the arm?—I noticed that there was a vaccination mark, but I saw nothing to call for any comment. Of course the œdema of the arm would make the vaccination scar very prominent.

14,842. The arm itself was very swollen?—Yes.

14,843. (*Professor Michael Foster.*) It was a scar; a cicatrix?—The cicatrix would look more depressed owing to the swelling of the arm.

14,844. It was a cicatrix, not a sore?—It was.\*

14,845. (*Sir William Savory.*) Was it a well-formed cicatrix?—I could not recollect exactly now, but I saw nothing to point out that the child was dying from this cause. Its eyes were mere slits, and the mouth and the nostrils were the same; it was intensely œdematous.

14,846. Mrs. Hart says, in answer to Question 14,231, “What was the state of the arm which had been vaccinated at the time the child died?” “It showed a large black hole; it never became a pock-mark at all; it made a deep hole in the child’s arm large enough to hold, they say, a pea; but I say large enough to hold an ordinary-sized Barcelona nut?”—I observed that in her evidence, I did not observe it in the child.

14,847. Can you explain that?—I saw no depression that would hold a Barcelona nut. I believe I do remember seeing that the cicatrix was very much depressed from the œdema of the surrounding parts, but there was no running sore. I saw no sore about the child’s arm.

14,848. You considered it was healed?—Yes, as regards the vaccination mark, certainly; I remember seeing no vaccination sore.

14,849. (*Chairman.*) The mother said that it was due to vaccination?—Yes, referring to the general condition of the child.

14,850. That would naturally lead you to look at the arm of the child?—I have no doubt I did, but I do not recollect anything particular about the appearance of the arm. I was very much annoyed at her bringing the child in a dying state to the out-patient room, and bundled them out as quickly as possible. I hoped to have seen the last of them, having strong reason to believe that they had come there to serve some special purpose.

14,851. (*Mr. Picton.*) The whole thing passed in a very few minutes?—Yes, it passed in a very few minutes.

14,852. You did not see any necessity to make a detailed examination of the child?—No; I went by the best of my judgment; I had not an opportunity of collecting the child’s urine, but I wrote down the conclusion I arrived at in my book.

14,853. You could see sufficiently to notice that the child was greatly swollen all over its body?—There was

œdema all over its body; it was a clinical picture of a child suffering from Bright’s disease.

14,854. How long would that swelling have been perceptible?—I remember that my impression at the time was that the child must have contracted a mild attack of scarlet fever unrecognised by the parents, and that it was suffering from scarlatinal nephritis.

14,855. Do you think the child had been suffering a week when you saw it?—Yes.

14,856. Would you say a fortnight?—Yes, I daresay, but I should not like to give a definite opinion as to the period.

14,857. Still it would have been suffering certainly a week before you saw it?—Yes.

14,858. (*Dr. Collins.*) Do you receive in-patients at the Infirmary?—Now I do; but then I was an out-patient physician.

14,859. You did not deem it a case requiring admission?—So far as I recollect (it is impossible to say after so long) they did not apply to have the child admitted; if they had applied to have the child admitted I should have had to send up for the house surgeon. It was under age, I think, also; we had not a children’s hospital at the time.

14,860. I understand you did express your opinion at the time that it was likely to die upon the road home?—Yes, I am certain now that they would not leave it. I used to make people the offer, if there was a bed vacant, and the case was a serious one, of leaving the patient in the institution. I presume I must have done so in that case, but either the parents were unwilling to leave the child—the child was too young to be left, I think—or we had no beds vacant.

14,861. You do not remember advising them to leave the child?—I do not remember doing so.

14,862. I think you expressed your satisfaction at having seen the last of them?—Yes, I expressed my satisfaction at having seen the last of them, since the smell in the room was unbearable from the child’s condition; they were very dirty people. I may mention that the Infirmary was made on more than one occasion the medium for bringing up a moribund patient in order to get a death certificate, and I was determined to put a stop to that.

14,863. It would be hardly incorrect to say apparently, as the mother said, that, in colloquial language, it was “water” that the child was suffering from, if the description you have given was correct?—I should not regard “water” as a disease at all; dropsy is only a symptom, not a “disease.”

14,864. Not if the child was suffering from dropsy?—“Water” is a popular synonym for dropsy.

14,865. Acute nephritis is a disease?—Acute nephritis I should regard as a primary disease.

14,866. What would you regard as the best symptom upon which you would rely as proving the existence of acute nephritis?—The condition of the urine. I have already stated that the child was too young to be made the subject of examination; I merely wrote down those notes not for the purpose of cross-examination, but to record my honest conviction of what was the matter with the child at the time I saw it.

14,866a. Did you examine the urine in this case?—As I said before, I had no opportunity of doing so.

14,867. Is acute nephritis a common disease with children at that age?—I cannot say that I have had many patients at that age suffering from acute nephritis. I thought at the time the child must be suffering from scarlatinal nephritis.

14,868. It would be true to say that, apart from scarlet fever, nephritis would be rather rare in patients at that age, would it not?—My experience is not extensive in nephritis in children.

14,869. Do you remember making a personal examination of the child’s arm?—I remember paying attention to all the points to which the mother directed my attention, but it is too long ago to recall every detail.

14,870. The examination you made was completed in five minutes?—Such examination as there was. If she drew my attention to the arm I should have examined the arm, and there was nothing more to be said upon the matter; the child was dying.

14,871. Do you happen to remember whether there was any erythematous condition of the skin?—None,

\* I was questioned by more than one member of the Commission (14,844; 14,879) as to the presence or absence of any running sore on the arm of the child Hart when I saw it. I replied to the effect that I had no recollection, so far as my memory served me, of having noticed any such sore, and that I should probably have recollected the circumstance had my attention been called to it. In the letter from the child’s father, headed “Belgrave Vaccination Case, &c.” (lines 23 and 24), he states: “For more than a month after the vaccination the marks ‘never ceased discharging.’ He does not say ‘up to the time of its death.’ I saw the child the day before its death, which, according to the mother’s evidence, occurred six weeks after it had been vaccinated; but if her statement be correct as to the vaccination having taken place in June, my interview occurring on the 23rd of November, I really saw the child five months after vaccination. I think it may therefore be assumed that there was no ‘sore’ upon the child’s arm when I saw it the day before its death.—J. H. N.



because I remarked the extreme whiteness of it. The picture of the child is before me now that the case has been recalled to my recollection. I remember the child was blanched as white as possible; there might have been a little blueness in certain parts, but it was waxy and cedematous.

14,872. I understand you to suggest that the alleged depression in the arm was possibly the result of the œdema, rendering the area around the scars prominent?—No, I said rendering the depression more marked.

14,873. That would make the area round the scars more prominent?—Yes, exactly; that is to say, the tissue outside the scar was swollen causing a greater depression than there would have been in the normal tissue.

14,874. Is that a common observation in dropsy?—I am unable to say; I have not paid particular attention to the condition of vaccination marks in cedematous subjects.

14,875. Could you tell the Commission at all as to the distribution of the œdema?—I remember the child's limbs were universally swollen, that of course making the folds more marked.

14,876. Was the head swollen?—The cheeks were swollen—the eyes were practically closed.

14,877. You are not able to tell the Commission of your own knowledge the date of the vaccination?—No, I have no means at all of knowing that.

14,878. Those statements you made with regard to the dates were based upon the assumption that the vaccination took place in June?—Yes, at the end of June.

14,879. (*Professor Michael Foster.*) You are confident, although you are only trusting to your memory, that there was no conspicuous sore upon the arm?—I have not the slightest recollection of any.

14,880. If there had been one, do you think it would have attracted your attention?—I think if there had been an open sore it would have attracted my attention.

14,881. (*Mr. Picton.*) I think you told the Commission that you made the remark that it was more probably dirt poisoning?—I did not say that exactly. I said dirt poisoning in the way of censure. The woman suggested the question to me: "Please, doctor, is it blood-poisoning?" I never made use of that term; she used it herself. It was for that reason that I asked permission to read Mr. Booth's letter because he says, "How could this woman have known anything about blood-poisoning unless it had been suggested by the doctor to the mother?" I said then, "Dirt poisoning more likely; how have you allowed the child to get into this filthy state?" She put the question to me plainly, and it was the fact of her asking that question that made me think she had a purpose in bringing the child there and in asking that question.

14,882. Was it anything in the condition of the arm that suggested to you that it was dirt poisoning?—Merely the general condition of the child—its smell and its dirty condition.

14,883. (*Dr. Collins.*) You were apparently on the alert when the questions of vaccination and blood-poisoning were suggested?—One is obliged to be on the alert in Leicester lest one should commit oneself.

14,884. Was the alertness due to any previous experience?—Not personally from anti-vaccinators, but only from reading the reports in the press.

14,885. You are not aware of any blood-poisoning from vaccination?—I have seen only one bad case from vaccination in my short experience, that was when I was a pupil in a village in the country.

14,886. Was that from blood-poisoning?—I was only a pupil at the time; I could not say exactly, but the mother was an extremely dirty woman living in a hovel close to a brook, which was nothing more nor less than an open sewer. I remember my principal making the remark that filth had a great deal to do with the child's condition; still, it recovered eventually, though it had a very bad arm indeed.

14,887. Do you doubt that there have been cases of blood-poisoning from vaccination?—I cannot express an opinion from hearsay only.

14,888. You have not studied the literature of the subject?—I have studied the literature, but still I should prefer to give an opinion only from cases I have known personally.

14,489. Having studied the literature, do you or do you not doubt that blood-poisoning does sometimes arise from vaccination?—Am I obliged to answer that question?

14,890. (*Chairman.*) I think so?—I have had no personal experience of blood-poisoning arising from vaccination; that I can conscientiously state, beyond that I prefer not to go.

14,891. (*Sir William Savory.*) You never saw it?—I never saw it beyond this one case about which I am unable to give evidence definitely; I was not qualified at the time, I was only a pupil in a country village.

14,892. (*Dr. Collins.*) Having studied the literature of the subject, you prefer not to answer the question whether you believe it is true or not that blood-poisoning does result from vaccination sometimes?—I cannot call to mind from such literature as has been at my disposal upon the subject of vaccination, that I have read of any case of blood-poisoning resulting from vaccination. I can say no more than that. My study of the subject has been perhaps more limited than that of some.

14,893. Your study has not been very extensive?—No, not very extensive. I prefer to use every possible care in carrying out the operation myself, and I can only say that I never have had a single bad case resulting from any operation I have had the pleasure of performing.

14,894. (*Professor Michael Foster.*) I should like to ask you a few questions with reference to isolation as practised in Leicester. You have been now in practice in Leicester for a good many years, have you not?—Not many years. I know very little about the isolation arrangements in the borough. I know that the system of isolation is most rigorously enforced and that compulsory notification is also enforced, and that every care is taken to prevent the spread of every infectious disease.

14,895. But you have not formed any opinion yourself as to that?—I was obliged to come to an opinion as to the result of an epidemic of scarlet fever.

14,896. But with reference to small-pox?—They never have had any small-pox since I have been in practice in Leicester, except a few isolated cases.

14,897. And with reference to scarlet fever, what do you say?—The system of isolation *versus* vaccination is very much bruited abroad; it struck me (answering your question) that if at any time we had an epidemic of small-pox similar to the epidemic of scarlet fever that occurred, when we had 50 cases waiting in Leicester and no beds to receive them, the effect might be rather disastrous. I was told there were 50 cases of poor people waiting for admission to the Fever Hospital, but that they could not be received.\*

14,898. Have they the same system with reference to scarlet fever as they have with reference to small-pox?—Yes, exactly, and the same place.

14,899. In that case the provision broke down?—Yes, because the provision was not equal to the extent of the epidemic.

14,900. You mean the hospital accommodation fell short?—Yes, I think 50 cases waiting for admission would have spread the disease pretty rapidly.

14,901. How long did that last?—I cannot say. I make a practice myself if I have a case of scarlet fever, even if it be a patient who can afford to pay, of sending him off at once to the borough hospital. I suggested that course lately to a very good patient of mine. I know persons in a good position who have, for the sake of the community, preferred to be carried to the hospital rather than be nursed in their own private houses.

\* As my statement as to there having, during my term of practice in Leicester, occurred an epidemic of scarlet fever, where the number of cases exceeded the isolation accommodation, was only founded on hearsay; I have interviewed Dr. Tomkins, our present Medical Officer of Health for the borough. He tells me "that such an event occurred in 1885; but at no time since he took office has the number of cases within the borough exceeded the number of beds at disposal."

This does not detract one iota from the validity of my statement; seeing that during the last epidemic (to which I especially referred) the majority of cases occurred in New Evington, New Humberstone and Belgrave; all of which are direct continuations of the town of Leicester, separated from it only by the "phantom" line of the "borough boundary."

The borough officials were therefore not *obliged* to accommodate all the patients in its Fever Hospital, but only such as they could find room for. The "demon" of infection, however, not recognising any such limit as a "borough boundary," had only to cross a narrow street to bring itself within "borough" jurisdiction. If, therefore, the "borough" is assailed by the "county" as a common danger, over which it has no control, but from which it is only separated by a narrow street; then in the case of a serious epidemic it must be prepared to isolate the contiguous county cases as well as its own, or this excellent provision will prove a failure.—J. H. N.

Mr. J. H. Neale, M.B., M.R.C.P.

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14,902. I understand from you that it is a matter of notoriety that in that epidemic of scarlet fever there were at least 50 cases which could not be accommodated in the hospital connected with the isolation system?—That is what I was told, but whether it is absolutely correct or not I am not able to say.

14,903. You did not consider that carefully?—I did not.

14,904. (Mr. Picton.) May I recall an answer you gave to Professor Foster just now, you said that practically there had been no small-pox in Leicester, and then afterwards you corrected that and said that there might have been two or three cases?—I have heard of two or three isolated cases, but there has been no epidemic. I should have heard of an epidemic if there had been one.

14,905. Are you aware that in 1888 there were 23 cases admitted?—I am not aware of that fact.

14,906. That in January there were six cases admitted in February there were four, in March there were six, and so on, making 23 in the whole year. That is a tolerable number, is it not?—Yes, I think now I do remember the fact that there were in one year more cases than usual. I think the disease was introduced by tramps, but I had quite forgotten the circumstances.

14,907. As a medical man do not you think it a noteworthy fact that there have been these introductions of the disease into Leicester without any spread of it?—I think it speaks in the highest terms to the credit of the authorities.

14,908. You will admit that it considerably modifies the effect of your previous answer, that there has been practically no small-pox in Leicester during your experience?—I do not regard 23 cases as a serious epidemic in a town of 135,000 inhabitants.

14,909. I was asking you whether it is not remarkable that no epidemic should have arisen?—I think, as I said before, that it reflects the greatest credit upon the authorities for the manner in which they dealt with the question. I am not here as an opponent of isolation. I think it is a most splendid provision.

14,910. You are aware that it is constantly said that if small-pox were only introduced into Leicester it

would be like fire to tinder?—I have never heard that said. I was speaking broadly of epidemics; I have not seen an epidemic of small-pox since I have been in practice.

14,911. Do not epidemics arise through the rapid spread of disease from one to another?—No doubt.

14,912. Take the epidemic in Sheffield, for instance; you have studied that case; the cases do not all begin at once?—No.

14,913. Only a few to begin with, in fact, two or three. If you remember the report in Sheffield, you are aware there was no such isolation system as exists in Leicester?—I believe I understood that to be the case at the time.

14,914. Do not you think as a medical man that if those two or three cases had been isolated in Sheffield to begin with it might have stopped the spread of the disease?—I think it very difficult to say without knowing the exact condition of the case.

14,915. (Sir Guyer Hunter.) Would it happen as a matter of course if there were, say half a dozen cases of small-pox in a town that necessarily an epidemic must ensue?—Certainly not.

14,916. Are not other facts important and indeed necessary for the production of an epidemic beyond the mere fact of small-pox existing among a few children?—Yes; climatic, hygienic, sanitary and the predisposition of individuals I should consider important.

14,917. (Mr. Picton.) Hygienic and sanitary conditions you would consider important as bearing upon small-pox?—As bearing upon any infectious disease.

14,918. (Dr. Collins.) I suppose an important factor in propagation of any epidemic would be that of personal infection, would it not?—I should think it an important factor among other important factors.

14,919. You do not consider it to be the most important?—I believe that a great many diseases are contracted by germs which are carried through the air without actual contact with the individual; in fact I have almost enough evidence to be certain that whooping-cough is so conveyed.

14,920. And small-pox?—I have no experience of small-pox.

The witness withdrew.

Mr.  
T. Wright.

Mr. THOMAS WRIGHT examined.

14,921. (Chairman.) You reside at The Hollies, Stoneygate, and are a solicitor practising at Leicester?—Yes.

14,922. You have been a member of the Corporation for 11 years?—Yes.

14,923. Representing East St. Margaret's Ward?—That was so until I was elected an Alderman.

14,924. You were Mayor of the borough for the year beginning in November 1887?—I was.

14,925. And you were elected an Alderman in 1888?—Yes.

14,926. And last year you were appointed a Justice of the Peace?—Yes.

14,927. Have you been called upon in your magisterial capacity to adjudicate in respect of vaccination cases?—I have not.

14,928. The period during which you have been on the Bench has been all subsequent to the determination not to prosecute?—That is so.

14,929. You do not desire, I believe, to offer any opinion as to the efficacy or inefficacy of vaccination, but you are opposed, I understand, to compulsion?—That is so.

14,930. You have long sympathized with those who have been proceeded against and fined and imprisoned, although they had conscientious objections to the performance of the operation of vaccination?—That is so.

14,931. I believe in December 1882 you introduced a deputation to the Mayor and magistrates asking them to reduce the penalties when they felt that the defaulters appearing before them were actuated by conscientious convictions?—I did.

14,932. You presented, I believe, a resolution which had been passed at a public meeting held on Friday,

24th November of that year?—Yes, the resolution was as follows: "That this meeting directs the attention of the Mayor and magistrates of the borough to the 31st section of the Vaccination Act, 1867, which confers absolute discretionary power on them, and allows them to accept any reasonable ground of objection to the operation of vaccination. And further that, as in other towns, a merely nominal fine without costs is inflicted, and in some cases no distraints are now issued, it calls upon the Mayor and magistrates of the borough to act upon one of the first principles of British law by giving the benefit of the doubt universally existing in respect to the efficacy of vaccination to those of their fellow townsmen who conscientiously object to the practice, and that a copy of this resolution be presented to the Mayor and magistrates."

14,933. Did any result follow?—There was, I believe, in some instances a reduction of fines, but that was not, I believe, a general rule, it depended upon the constitution of the Bench from time to time.

14,934. I believe you at the same time called attention to what had been said by Mr. Dodson, the President of the Local Government Board in answer to a question addressed to him in the House of Commons?—I did; the part to which I called attention was the following expression: "At the same time I may add that it is open to the Justices in any such case to impose a nominal fine or decline to make an order for the vaccination of the child, and I should hope that when any such case occurs it will be considerably and tenderly dealt with."

14,935. (Dr. Collins.) What particular case did that refer to?—I am not in a position to give you that information, that was a quotation from a speech by Mr. Dodson as President of the Local Government Board.



14,936. In answer to a question in the House?—Yes.

14,937. Have you the question with you?—I have not; it was reported in the "Times" parliamentary report of the 28th of November 1882, so that it would no doubt have been put the day before.

14,938. (*Chairman.*) Did you also quote from a leading article of the "Times" of the 17th of November 1882?—I did; this sentence: "There could be no doubt that it had been a channel for the communication of constitutional disease of a very grave character, and also for the communication of local infections such as erysipelas, possibly, productive of speedily fatal results."

14,939. In 1883 I believe you became president of the league which exists in the town against compulsory vaccination?—For that year I was.

14,940. And you have in one or two instances undertaken the defence of anti-vaccinators?—I have.

14,941. In May 1883 I believe you conducted the case for Mr. Pratt, who brought an action against the police for excessive restraint?—I did, and damages were awarded of 7*l.* and costs by the County Court judge for excessive restraint; there were several cases of that kind; they did not all result in actions. I was consulted in one or two cases, but I did not advise taking proceedings.

14,942. Do you think it would be practicable in Leicester to enforce vaccination by compulsion?—I am quite sure it would not be practicable without creating such a disturbance of the public peace as would be extremely undesirable.

14,943. (*Mr. Picton.*) When you were for one year president of the anti-compulsion league you expressed yourself publicly as opposed to compulsion did you not?—I did.

14,944. It was well known that your opinions were of that character?—Unquestionably.

14,945. It was after that that you were elected Alderman and Mayor?—Yes, and Alderman of the county.

14,946. After that you were appointed a Justice of the Peace?—Yes.

14,947. That was after you had expressed yourself as opposed to the law?—Yes. I was much influenced by a circumstance which occurred when I was residing at Northampton. A case was brought under my notice of a coachbuilder named Davies whose daughter had after

vaccination developed unmistakable signs of syphilis; he, Davies, was perfectly satisfied that in their family there were no causes for such a development. The girl lived many years, suffered horribly during those years, and ultimately died, as he and his family believed, from the poison which was introduced into her blood by vaccination.

14,948. Have you avoided sitting upon the Bench for the adjudication of vaccination cases?—No; not at all.

14,949. Your non-connexion with these vaccination prosecutions has not been owing to your absentsing yourself from the Bench?—Certainly not.

14,950. Suppose such a case coming before you, what would you do?—I should deal with it on its merits, and if upon the facts it appeared to me that the parent had reasonable and conscientious objection to vaccination being performed upon his child, whilst bound to enforce the law, I should inflict the smallest possible penalty.

14,951. (*Dr. Collins.*) Are you satisfied that such reasonable objections are real in the minds of parents?—I am satisfied from many instances which have come under my notice that people who are not ordinarily unreasonable, people in different ranks of life, not by any means confined to the ordinary working element of the town, but people in better positions who look at these matters from what I regard as a reasonable standpoint, have come to their conclusions with a sincere desire, I am satisfied, to do what is right to their children and to their own consciences.

14,952. Do you happen to know whether that reply of Mr. Dodson to the effect that he hoped that such cases would be considerably dealt with did not apply to cases in which upon prosecution for subsequent children the parents allege that a previous child had been injured by vaccination?—I have some recollection of that being the ground on which the question was put to Mr. Dodson, but I have not looked into the report recently.

14,953. (*Mr. Meadows White.*) Have you formed any opinion as to the probable effect upon vaccination of repealing the compulsory law?—My feeling is that vaccination would be more general if the compulsion were removed than if it were applied.

14,954. Does that remark apply to Leicester only?—I can only speak for Leicester. I believe seriously that there would be more vaccination if the compulsion were withdrawn.

The witness withdrew.

The Reverend ALBERT SMITH examined.

14,955. (*Chairman.*) You live in St. Saviour's Road, Leicester?—Yes, Plutus House.

14,956. You have been engaged in the scholastic profession, I believe?—Yes.

14,957. And also as a minister and missionary in Lancashire?—Yes.

14,958. You were ordained by the Bishop of Manchester some years ago?—Yes.

14,959. You have ten children, I believe?—Yes, I have now ten children and none of them have ever been under medical treatment.

14,960. And only one of them has been vaccinated?—Yes, that is all, only one.

14,961. What led you first to take an unfavourable view of vaccination?—A young brother of mine named William was vaccinated, and for several years afterwards he suffered from eruptions in different parts of his body which we thought were owing to the vaccination, because before the vaccination his skin was perfectly clear.

14,962. How much younger was he than you?—He was 15 years my junior. No other member of the family ever had such eruptions, so his parents condemned the lymph as being bad matter.

14,963. You accordingly determined not to have your children vaccinated?—I did not think very much about the subject until some years afterwards. When I was married and my first child Sarah was born August 1872, I then remembered my brother's experience, and believing he had suffered through his vaccination, and not knowing any reason sufficient to my mind why I should

submit my children to the operation, I decided to leave the child unvaccinated. I was threatened with the usual proceedings, but owing to a change of residence, the prosecution was not carried out.

14,964. Then you were summoned in respect of your next child?—I am not sure whether it was the next or the one following as I cannot find the papers, but I believe for one of the two; one was born in 1873, and the other in 1875.

14,965. I will come to one further on. In 1877 your child Harold was born; were you summoned for his non-vaccination, and did you appear before the magistrates at the Leigh Petty Sessions, near Manchester?—I appeared and pleaded my reasons for non-compliance with the Act. We then resided at the Manor House, Astley, opposite to which lived a child who was a great sufferer through vaccination. I had often seen this child; its mother took it regularly to the Manchester Infirmary for treatment; the joints of its arms and knees were continually breaking out with frightfully irritating and foul-smelling sores.

14,966. Did you know anything as to vaccination being the cause of that, except that the mother attributed it to vaccination?—No; only from the testimony of its parents. I know its mother spent a great many pounds upon it, and she told me that the child was a great sufferer after its vaccination, and I saw that it was a sufferer, and I was told that it was quite well before the operation.

14,967. Did you tell the magistrates that you did not wish to risk the same possibilities with reference to your child?—I said that seeing such a case as this, and hear-

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ing that such results did follow vaccination I felt I ought not to be obliged to subject my child to the risk of any such dangers. I pointed out that the good old Book said that the whole needed not a physician, but only they that were sick; and I objected to being a party to committing evil, as I thought, in order that future benefit might arise. I was then laughed out of court by the magistrate's clerk for quoting one or two Bible texts. He said, "We have nothing to do with religious scruples here; we do not want a sermon in a Police Court," and I quite understood the objection.

14,968. What did the magistrates say?—One of them said he respected my convictions, and that he had no doubt I was conscientious, but that they must from their point of view enforce the law; they would he said inflict upon me a small fine now, but a larger one should I have to appear again. I was fined 5s. and costs; the fine was paid. This prosecution and the publication of it in a local newspaper under the head of "A Sermon in a Police Court," did me a great deal of harm, much more than the mere fine of 5s. and costs; it threatened for a time to ruin my prospects. I was preparing for my final examinations preparatory to entering holy orders in the Church of England, and the late Dr. Fraser, the then Bishop of Manchester, had promised to accept me for ordination as a Literate as soon as I had passed the Oxford and Cambridge preliminary examination. I was studying for this under Dr. Hewlett, formerly Vicar of Astley. This gentleman was very much scandalised by my having to appear in a Police Court, and also by the article in the local newspaper, "The Leigh Chronicle" I think it was, under the heading I have already given you. He intimated to me that should I have to appear a second time it would seriously imperil my prospect of ordination. In a short time I received a further notice dated December 3rd of the same year from the Vaccination Officer threatening me with further proceedings, for the same child of course, if the Act were not immediately complied with. I stood out again, and on its becoming known that I was about to be summoned a second time Dr. Hewlett definitely informed me that if I appeared again in the Police Court he could not recommend me to the Bishop nor would my ordination be proceeded with. He was a gentleman from whom I should have had to receive letters of recommendation, and he said he would not be able to give me his if I did not submit.

14,969. Did your wife accordingly persuade you to get the child vaccinated or did you allow her to get the child vaccinated by a private practitioner?—Yes. We felt it was a great blow to us, and for a time I purposed standing out and contemplated throwing up my prospects; but owing to the solicitations of my wife and friends I gave way, I smothered my convictions and the child was vaccinated. It was taken to Manchester and vaccinated by a private practitioner; one mark only being made, I believe.

14,970. You were shortly afterwards ordained?—Yes, my examinations came off shortly afterwards; the Oxford and Cambridge examination, I think, came off the latter part of the same month, and when the law was satisfied I was ordained to preach the Gospel.

14,971. After you were ordained were you licensed to officiate in the parish church of Withnell near Chorley?—Yes, I was licensed by the Bishop to officiate in that parish and church.

14,972. Did you there meet with any case which you believed to be the result of vaccination?—Yes, a rather remarkable case. As I and the Vicar were going our rounds soon after I went to the parish and he was introducing me to the parishioners we met with what seemed to me a case of severe suffering and injury following vaccination. The Vicar and I were calling at the house of a respectable married couple living behind Withnell Hall; the husband was, I believe, a coachman attached to the Hall; as we opened the door to enter the cottage we were both shocked to see a little child with the scarlet flush of disease on its face walking across the floor towards us. The Vicar drew back and declined to shake hands with the mother for fear, as he afterwards told me, of contagion, as he thought it might be a case of erysipelas or some disease of a worse character. The mother of the child looked somewhat abashed until she explained to us that it was "all through the vaccination."

14,973. Did you see anything more of that case after that?—I may have seen the child once or twice afterwards, but that is all. I did not make any special inquiries about the case.

14,974. Did you after that leave that parish and go to Blackburn?—A little time afterwards I left that parish and removed to Blackburn, a town close by.

14,975. Then you were again fined in 1883?—I was again summoned, this time for a child named Karl.

14,976. There was the ordinary summons and order for vaccination, and you were fined 10s. and costs?—Yes, we ran through the usual routine.

14,977. On March 19th, 1886, were you again summoned on account of another child?—I may say I appeared on behalf of the child Karl in Blackburn, and pleaded my objections to the operation, but I was fined then also. Then on March 19th, 1886, I again appeared on behalf of another child and pleaded, so far as I was allowed, my objections to the operation.

14,978. An order was made to have the child vaccinated?—Yes, the order was made but never carried out.

14,979. In May of the same year you were summoned for omitting to comply with that order?—Yes.

14,980. And you were fined 10s. and costs?—Yes. I pleaded that as I was the natural custodian and guardian of the child I had the right to refuse to submit it to what I believed to be an injurious operation, but I was fined again 10s. and costs. I resolved not to pay the fine this time, and shortly afterwards a police sergeant and two other policemen paid a visit to my house and impounded a valuable harmonium, worth 18l., to cover the fine.

14,981. Was that harmonium sold?—Yes, a few days afterwards the sale took place in front of our house in Beaumont Terrace, Whalley Range. I refused to allow it to be sold in the house or in the front garden; it seemed to me monstrous to take my own private property and to sell it for a debt which I had not morally incurred; so the harmonium was taken out on the road and sold. A friend of mine happened to come up at the time—an acquaintance I would rather say than a friend—and he bought the harmonium.

14,982. Did he buy it for himself or to let you have it?—The harmonium was taken to his house, but I afterwards recovered it. Of course I might have proceeded against the police for excessive distraint and loss had I not recovered it.

14,983. The last time you were summoned was in October 1886?—Yes, for the non-vaccination of a child named Aubrey. I felt it was no use appearing personally, as my pleas were not listened to, so my wife went and she told the magistrates that we had conscientious objections against the practice; that our children were healthy and had never been subject to any medical treatment, and that we did not want any foreign disease infused into their system. The magistrates refused again to listen to the plea, and we were fined this time the highest amount the law allowed, 20s. and costs, I suppose merely because in the meantime I had delivered one or two public addresses upon the subject, giving my reasons for refusing to submit to the operation. My last child, born in Leicester, has not been vaccinated.

14,984. (*Sir Edwin Galsworthy.*) Did any evil or bad result happen to the child that was vaccinated?—No. I believe its mother took care that such results should not follow.

14,985. How could she do that?—I believe she rubbed off the vaccine lymph with salt and water directly after the operation was performed.

14,986. Did it not take?—It did not take.

14,987. (*Dr. Bristowe.*) Did you get a certificate of effective vaccination?—No, we saw nothing of the certificate. We had taken the child to Manchester; we were living then a few miles out of Manchester, in Astley.

14,988. At any rate, you were not summoned again?—No, I was not summoned again, so I presume the certificate was forwarded. I might say that there is a great deal of quiet suffering which never comes to the eye of the public. I have visited a good deal about in parishes in different places, and have found people in many cases suffering quietly from the effects of this operation. Many people object to having the details of their child's sufferings made public; they prefer to keep quiet lest any reflection should be thrown upon the family or upon the medical adviser, to whom, in some cases, they are attached.

14,989. (*Sir Charles Dalrymple.*) Have you seen much of the literature of the anti-vaccination movement?—When I was first prosecuted I was not acquainted with



any anti-vaccination movement, nor did I know another anti-vaccinator in the whole world, but since then I have seen much of it.

14,990. Should you say that that represents an

The witness withdrew.

Mr. JAMES LEAVESLEY examined.

14,991. (*Chairman.*) You are a boot and shoe manufacturer, residing at Bethany Villa, Humberstone Road, Leicester?—I am.

14,992. You were elected a member of the Leicester Town Council in 1887?—I was.

14,993. And a member of the Barrow Board of Guardians in 1888?—I was.

14,994. You were a member of the Leicester Board of Guardians from 1882 to 1889?—I was.

14,995. That covers the time during which the vaccination question was strongly debated in Leicester?—Yes; but it was debated many years previously.

14,996. And ultimately it was decided not to prosecute?—That was so.

14,997. You were elected chairman of the Leicester Board of Guardians in 1887?—Yes.

14,998. Your attention was first called to the vaccination question, I believe, about 30 years ago?—That was so.

14,999. How was that?—By observing a large bill exhibited in a hairdresser's room in Leicester, containing the names of several medical gentlemen who declared themselves opposed to vaccination; I do not now remember their names, but the bill caused me to look into the subject. I found that vaccination did not prevent small-pox, and from circumstances which occurred I found also that re-vaccination was a failure, and I had reason to believe that the operation was capable of imparting disease into the system, notwithstanding that I did not strongly oppose the vaccination of my first child, but the second child was vaccinated against my will. My other six children were not vaccinated. Five of them are still living.

15,000. You were afterwards summoned for the non-vaccination of some of your children?—On August 21st, 1871, I was first summoned before the Leicester magistrates for the non-vaccination of a child named Albert Henry, and I was fined on that occasion 20s. or 10 days' imprisonment.

15,001. Were you again summoned and fined on the 23rd of May 1873, and on the 1st of May 1876, for two other children?—I was.

15,002. During the last 20 years have you had any opportunity of witnessing the injurious effects of vaccination?—I have; one case that I remember particularly was a child brought to my office by its mother with the flesh of its arm eaten away to the bone. I had intended to produce a photograph of this child, but I lent it to a friend, and I do not remember receiving it back again.

15,003. What age was the child?—As nearly as I remember about 12 months.

15,004. Was your statement that it was from vaccination that the suffering arose derived from the representation made to you by the mother?—It must have been from vaccination, because the sore was only where the vaccination had taken place. It was a beautiful child in other appearances, but the four punctures had eaten the flesh away into one deep sore to the bone.

15,005. Was there another child named Wragg that you also saw?—There was also a child of parents named Wragg, residing at that time in Martin Street, Leicester. When I first saw it it was six years old; the child was quite an imbecile, and Mrs. Wragg declared to me that in her belief the cause was vaccination. I saw the same child three years afterwards, and eventually, when it was 12 years old, it was brought to the Leicester Workhouse, and died there at the age of 13 years.

15,006. Was it in any sense wanting in its faculties?—Yes, the mother told me the inflammation from the arm seized the brain, and the child gradually lost its rationality and became what I then saw it to be.

15,007. Do you know at what age it was vaccinated?—As nearly as I remember it was vaccinated at about 3 months.

amount of "quiet suffering"?—Not perhaps that which is brought to light; but I believe this is only a very small portion of the suffering which is entailed by the practice of vaccination.

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Mr.  
J. Leavesley.

15,008. Did you see a child named Hart?—There was also a child named Hart living with its parents at Belgrave, a suburb of Leicester; in this case the child was so seriously injured that it died in a very short time after the operation.

15,009. Where is your information about that case derived from?—I was an eye-witness of the child shortly after its vaccination, within perhaps a month after the vaccination; and the child was in a most deplorable condition when I saw it; it was swollen all over its body and its limbs. Its mother raised the arm to show me inside the elbow; the flesh was laid bare, the skin was broken the same under the arm-pits, the same at the wrists, and the same at the groin, and under the knees and the ankles of the child.

15,010. Do you know how long it was before the child's death that you saw it?—As nearly as I can remember about a fortnight. I have not the exact date, but it was vaccinated the latter end of October, and it died early in December.

15,011. Why do you attribute the swollen condition to vaccination?—The mother's testimony to me was that before the child was vaccinated it was to all appearance pure and healthy, and shortly after its vaccination the inflammation seized the arms, and from thence spread to all parts of the body.

15,012. Did the body present a very inflamed appearance besides being swollen?—It did.

15,013. Was it all red?—Especially where the skin was broken and the flesh laid bare.

15,014. There, of course, it would; but where the skin was not broken did it look red, or was it merely swollen?—I could not positively speak as to the exact colour of the skin.

15,015. Did you specially examine the part where it had been vaccinated?—I do not remember specially examining the arm. Of course my attention was called to the condition of the child's whole body, even to its finger ends and its toes, from which matter was oozing at the time.

15,016. How came you to go and see that child?—Because of the report which came to my ears of the case of a child which had been vaccinated, and was suffering severely from the effects of vaccination.

15,017. Do you remember if there was any report made by Dr. Emms to the Board of Guardians on the subject?—I believe there was. I was at that time chairman of the Leicester Board of Guardians.

15,018. But this would be the Barrow Board of Guardians?—As this was in the Barrow Union I wrote a letter to the chairman of the Barrow Board calling attention to this sad case.

15,019. You were yourself chairman of the Barrow Board, were you not?—I was not a member of the Barrow Board until the year 1888; I have been so now three years, but have never been chairman of that board.

15,020. Perhaps you will be good enough to see if you can obtain from any document in the possession of the Barrow Board, the report made by Dr. Emms in the autumn of 1887 about this child, and also any written report, if there were any, by the Guardians?—I will be pleased to do so.

15,021. Was there also a child named Wardle that you were acquainted with?—There was a child named Wardle, which was never well after vaccination. This was a most revolting case; the boy died at the age of 12 years, after a life of excruciating suffering.

15,022. When did you first become acquainted with this case?—There was a woman of the name of Mrs. Payne, who was always very active in the anti-vaccination movement in Leicester, and it was a matter of surprise to me that this woman, beyond all others of her sex, should make herself so prominent in the anti-vaccination movement in the town, but my surprise ceased when I saw her grandchild in the condition which I saw it in.



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15,023. How old was the child when you saw it?—Nearly 12 years old; it was a small room where the child was. The grandmother, as the child's leg was being unbound, sat on the hearth. I was standing with the open door in my hand, and she was relating in detail the condition of the child right away from its vaccination as a baby, how the inflammation from the arm had seized every joint in the body, and had ultimately focussed itself in one of the legs, and they were expecting almost daily that the bone would be entirely decayed through, and that the leg would fall off, but happily death put an end to the child's sufferings before that took place. I had to ask the grandmother to please excuse me, for the stench was such, although I had the door open in my hand, that I could not endure to stay longer.

15,024. Your only knowledge of the case is that which the grandmother told you?—That is so, but she attributed the child's sufferings without the slightest doubt whatever to vaccination, hence her vehemence in opposing it.

15,025. Then another case after that was that of Constance May Wood, of New Humberstone; we need not trouble you about that, that was the case where Dr. Ballard made a report?—That was so.

15,026. In your experience there have, I believe, been many cases of parents amongst the most thoughtful and respectable of the working class in Leicester, who have been subject to imprisonment and distress?—That is so, I know a great number of those in Leicester, and the surrounding districts, who have suffered imprisonment, loss of goods, and who have been fined for their conscientious objections to vaccination. In most of these instances they are parents who take an interest in their children's welfare, and are amongst the most thoughtful and respectable of the class to which they belong.

15,027. (*Sir William Savory.*) You stated, I think, that the child Hart was vaccinated in October?—At the latter end of October.

15,028. How do you know?—From the register which reports that case, I think, on the 28th of October along with several others of the same date.

15,029. In none of the instances you have mentioned, in which you have seen or heard of injury following vaccination, has the evidence been more satisfactory to your mind than in the case of the child Hart? You would say that the evidence in that case was at least as strong as in any other?—I should say that was one case out of a number in which the strongest suspicions rest upon vaccination.

15,030. Do you know of any other case in which the evidence that vaccination was the cause of injury was stronger than in the case of the child Hart?—Unless you would so regard the circumstances before mentioned in the case of the child Wragg, and the other case to which I made reference.

15,031. Why do you think the evidence in those cases stronger than in the case of the child Hart?—I do not know that I should have reason to say that it was stronger; each case to my mind looks suspiciously strong against vaccination.

15,032. Were you satisfied in the case of the child Hart that the result was due to vaccination?—I was and always shall be.

15,033. (*Mr. Meadows White.*) Has there been any medical inquiry into any of those cases in Leicester?—Yes, in reference to the child Constance May Wood.

15,034. We have heard of that, but with the exception of that case?—Excepting that case, I do not remember for the moment that there has been any public inquiry respecting them.

15,035. (*Dr. Collins.*) A question was put to you by Sir William Savory whether you consider the evidence in the case of the child Hart as strong as that in any of the other cases you mentioned—the case of the child named Wood was the subject, I think, of a report by Dr. Ballard on January 7th, 1889?—That is so.

15,036. That child was certified to have died from "Diffuse cellulitis"?—I believe that was so.

15,037. Dr. Ballard adds that he told the vaccinator that he ought to have mentioned vaccination upon his certificate of death?—I believe that was so.

15,038. You saw the child Hart personally?—I did.

15,039. Will you tell the Commission the condition of the arm when you saw it?—The arm was intensely swollen; if you mean where the vaccination took place, I could not positively speak, for my attention was so taken up by the general condition of the child as a whole that I could not possibly speak to the precise spot where the vaccination took place.

15,040. Did you look at the vaccinated arm?—I do not recollect the precise condition of that part.

15,041. How long after its vaccination did you see the child?—I think, as nearly as I remember, about a month afterwards; some time in November.

15,042. Were you instrumental in bringing the case of the child Hart to the notice of this Commission?—I spoke about it, and reported it; it was reported in the newspapers, and spoken about in public places.

15,043. Were you instrumental in bringing Mrs. Hart before this Commission to give evidence?—I was not immediately so.

15,044. Did you examine the child Wood at the residence of the parents?—I did.

15,045. As a member of the Board of Guardians did you observe whether the condition of the premises was such as to constitute a nuisance?—I noticed the premises, and they were very like the surrounding premises in the neighbourhood.

15,046. Did it appear to you likely that the sanitary conditions under which the child Wood was living were such as to originate erysipelas in the child?—By no means.

15,047. (*Sir Charles Dalrymple.*) You said that you did not particularly notice the condition of the arm of the child, but that its general condition was deplorable. If you did not notice the condition of the arm did it occur to you as obvious that the condition in which it was was owing to its vaccination?—It did occur to me that in all probability it was owing to its vaccination from the fact that before the child was vaccinated it was reported as being well; had it not been so I suppose it would not have been vaccinated. Then this inflammation set in immediately afterwards; and the condition in which I saw the child affected the whole body, and my attention was rather directed to the swollen condition of the limbs of the child; when the mother raised the arm to show me the inside of the elbow and inside the knee and leg, and the ankle, my attention was directed more to those places which the mother showed me.

15,048. Had you any information about the child except from the mother?—None, except what the mother stated.

15,049. Is it your custom when a woman is in great trouble about her suffering child to accept her statements as absolutely reliable without any confirmation?—We are obliged to rely upon the statements of parents as to the condition of their children before and after vaccination. Unfortunately we cannot place all that reliance upon medical testimony in these matters that would be desirable.

15,050. You give the preference to the testimony of the parents over medical evidence?—As a rule I should. The case of the child Constance May Wood would certainly never have been acknowledged medically as resulting from vaccination if the Local Government Board had not sent officially to investigate the case.

15,051. (*Chairman.*) The official sent down was a doctor?—True; and I regard it as to his honour that he came to the decision he did in reference to it; but we were thoroughly convinced, apart from his report, that it was vaccination that killed the child. The child, as you know, had been chosen from its extremely healthy appearance as vaccinifer for the neighbourhood, but still the medical man who vaccinated the child refused to state in his certificate that death was caused by vaccination, and would have left it entirely out if it had not been for the official investigation afterwards. I say, all honour to the medical gentleman who investigated that case.

15,052. (*Sir William Savory.*) You were asked just now in the case of a child whether the conditions were such as would be likely to produce erysipelas, and you answered at once, No?—The sanitary conditions of the dwelling were what the question related to. I think the sanitary conditions of the premises were so equal to the general condition of like neighbourhoods that I did not see anything out of the ordinary way to arrest my attention



15,053. Did you investigate them?—I did not specially investigate the condition of the neighbourhood from a sanitary standpoint, but, living near, and having been to the house repeatedly during this child's suffering I

saw nothing in the house which did not apply to houses of that class in general.

15,054. On that ground you answered the question?—Yes; on that ground I answered the question.

The witness withdrew.

Mr. CHARLES LUNN examined.

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Mr.  
C. Lunn.

15,055. (*Chairman.*) You are a hosiery manufacturer, residing at Venetia House, Aylestone Road, Leicester?—Yes.

15,056. You formerly believed in vaccination?—Yes, I did.

15,057. And you had some of your children vaccinated?—Yes.

15,058. Did any of them, in your belief, suffer from vaccination?—They did.

15,059. In what way?—My eldest child, a daughter, was vaccinated in the usual way in two places, and the operation did not take. She was, about a fortnight afterwards, vaccinated in three other places, and then all the five places took, and she was seriously ill for a long time, and after she got better she was afflicted with sore eyes, which she had never had before, and, in fact, has them to some extent even now.

15,060. What was her age at the time of vaccination?—About the usual age; about six months old.

15,061. What kind of complaint was it that she suffered from?—Little gatherings all round the eyelashes. That was the kind of soreness that there was.

15,062. How old is she now?—Twenty.

15,063. Have any of your other children been vaccinated?—My second, a boy, was vaccinated about two years afterwards; there were no ill effects so far as I saw from that. A third child, Charles Harold, was vaccinated; he was quite healthy before, but after he got better from the vaccination he also suffered in the same form with sore eyes, and has weak eyes up to the present time. I attribute both their weaknesses in that respect to the result of vaccination.

15,064. They were, of course, vaccinated at different times?—Yes; they were vaccinated when they were about three months old.

15,065. They were not vaccinated from the same subject?—They were vaccinated by the same medical man.

15,066. But not from the same vacciner?—I do not know where he got his lymph from, I have no idea.

15,067. None of your children born since that time have been vaccinated, have they?—No.

15,068. But there were some that you were summoned in respect of?—We have had nine in all, the other six have not been vaccinated, and so far as I can prevent it they are not going to be; three have been vaccinated; the other six have not been. For one of them I have been distrained upon, and have been several times summoned and paid fines.

15,069. Did they on one occasion distrain a considerable number of articles of much greater value than the fine?—They distrained furniture to the value of something like 20*l.* for a matter of 2*s.* The fine was 10*s.* and 1*s.* costs, and they took all my drawing-room furniture and several other articles besides. They treated me in a shameful way I considered at the time, but that is some seven or eight years ago.

15,070. Have you been distrained upon on more than one occasion?—Only on one occasion, I have paid the fines since. I could not fight the battles, because it was such a strain upon my wife's health; she is very delicate, and at the time when the distraint took place she was seriously ill and in bed, and the upset caused her to be very much worse. That was the reason I did not fight the battles any further, otherwise I would not have paid any fines, because I consider the thing utterly iniquitous. I may say I have a very strong feeling in reference to this matter, not only on my own account, but 70 years ago when my father was a child he was not vaccinated but inoculated by a doctor from a small-pox patient, and the result was that he had the small-pox most seriously, and was partly blind for weeks. His brother, who was inoculated at the same time, had it very much worse than he had; he was not

only blind and seriously pitted, but he was seamed with it. I remember his face distinctly; he is dead now, but his face was a mass of seams, not simply pitted; and I consider the doctors were altogether wrong then when they forced people to be inoculated.

15,071. You were summoned in 1885 and again in 1888, I think?—I was summoned in the first instance, I think, in 1883, and after that I was summoned again because one of the articles that was distrained upon, a china vase, was not forthcoming when the police came for the furniture and articles distrained upon. It was not removed by me; I knew nothing about it. I found out afterwards that a servant girl we had, who had as strong feelings as I had myself against vaccination, had removed the article to a place of hiding, and it could not be found. An action was brought against me because the result of the auction was a deficiency of 4*s.* 6*d.* I think that matter cost me something like 12*l.* or 13*l.* to defend it. I have done all I possibly could at all times in regard to helping on the cause of anti-vaccination. I have written to different members of Parliament and I have received letters from them, one from Mr. P. A. Taylor of the 26th April 1883 in which he wrote, saying: "I need hardly say I shall continue to do all I can to abolish the stupid superstition of vaccination. In the meantime I hope all Leicester men will do all they can to keep up the spirit of resistance." Also from Mr. A. McArthur; he wrote on the same date, 26th April 1883: "I am in receipt of your letter, and regret to hear of the trouble you have had. I cannot agree with those who regard vaccination as useless, but I sympathize with those who suffer for their conscientious conviction, and should be glad to see some means devised for their relief. This I hope we may see before very long." I also wrote to the Right Hon. John Bright, and he replied to me on the 15th May 1880, saying: "I am very sorry to hear of your troubles, but fear I can do nothing to lessen them. The repeated penalties seem to be in all respects mischievous and cruel. I shall be glad to do all in my power to put an end to them. They are the main supports of the movement against vaccination, and so long as they are inflicted, the movement will extend in area and grow in force. I express no opinion on the main question. The facts as far as I have examined them seem to me to favour the system, but I doubt the wisdom of the compulsion, and I altogether condemn the repeated penalties. If vaccination is as useful as its advocates say it is, then I think it might have been generally adopted under the influence of example and persuasion. Compulsion in the family, and as respects the treatment of children, is necessarily offensive and hateful, and the repeated infliction of penalties is a sure method of exciting hostility and obstinate resistance. As to your complaint of the mode of distraint, I hope your magistrates will see that no needless harshness is practised upon those who feel themselves bound to disobey a law which on the face of it invites doubt if not condemnation." In 1885 I was again summoned for the non-vaccination of my daughter Gertrude Hilda, for which I was fined 1*l.* (including costs).

15,072. (*Mr. Picton.*) You have six children unvaccinated; have any of those children suffered from their eyes?—No; they are as healthy a family of children as you would find anywhere.

15,073. No appearance of anything of the kind?—No appearance of anything of the kind. I can attribute the sore eyes to nothing else but vaccination.

15,074. (*Sir Edwin Galsworthy.*) How long after the vaccination did the soreness of the eyes appear?—In a few weeks afterwards; I cannot tell you to a few days, but almost immediately afterwards; it seemed to us to be the natural result of the operation.

15,075. (*Chairman.*) Do you know at all whether that is a common result or an ascertained result?—I do not, but I have heard of other cases in which the eyes have



been affected afterwards; I have known many instances in Leicester of children who have been injured by vaccination.

18 Mar. 1891. 15,076. But I am speaking of this particular class of injury, has your boy the same thing?—Just the same; just similar in appearance; little white specks break out very frequently, and in the morning their eyes are mattery and unpleasant.

15,077. (*Sir Edwin Galsworthy.*) Do you mean to say that that is the case at the present time?—Yes.

15,078. What ages are they?—The eldest is 20 years and the next is 16.

15,079. How long does it last?—Sometimes it passes away altogether, and then it breaks out occasionally in both eyes.

15,080. How long does it last when it breaks out?—I notice it sometimes three or four weeks together worse than at other times, but none of the other children have anything of the sort, and we can attribute it to nothing but that, in fact; the whole system is hateful to me.

The witness withdrew.

Mr. JAMES DUNS examined.

15,084. (*Chairman.*) You are Chief Constable of the borough of Leicester?—I am.

15,085. And you have held that position since March 1882?—Yes.

15,086. Your force consists of 130 men?—Yes.

15,087. That is the officers and constables together?—Yes.

15,088. The population of Leicester is estimated at a little over 150,000?—Yes.

15,089. During the police year ending the 29th of September 1882 were there 949 persons proceeded against under the Vaccination Acts?—Yes.

15,090. In 1883 were there 422 proceeded against?—Yes.

15,091. And in 1884, 791?—Yes.

15,092. And in 1885, 1,010?—Yes.

15,093. And in 1886, 730?—Yes.

15,094. Since that date the prosecutions have ceased, have they not?—That is so.

15,095. Were several distress warrants issued against persons for non-payment of fines whose goods were distrained and sold by public auction?—There were.

15,096. Was there sometimes a disturbance at some of these sales?—Yes, such as shouting, hooting, and jostling people about.

15,097. By those who were hostile to the proceedings which led to the sale?—Yes, quite so.

The witness withdrew.

Mr. THOMAS PRATT examined.

15,107. (*Chairman.*) You are a painter and decorator, living at 82, Sparkenhoe Street, Leicester?—Yes.

15,108. You were yourself vaccinated, and at one time you believed in vaccination?—Yes.

15,109. What led you to entertain doubts upon the subject?—The first thing which arrested my attention, and led me to doubt vaccination, was a statement I read which was made by Mr. Hutchinson to the effect that syphilis might be transmitted through the vaccine lymph, even though it be taken from a perfectly healthy looking child. I will just read the quotation from the evidence of Mr. Hutchinson, surgeon to the London Hospital, which will be found at page 283 of the Blue Book containing the evidence before the Vaccination Committee of 1871: "Thirteen persons, most of them young adults, were vaccinated from one child on the 7th February . . . the child had been lent to the surgeon who took the lymph from its arm for the purpose of vaccination from a public vaccinating station . . . two months later I was asked to see the sores on the arms of the patients who had been vaccinated; out of the 13, 11 had on their arms sores

15,081. But one of those who have been vaccinated has not suffered in that way?—That is so, the second one has not suffered in that way.

15,082. Your goods were seized for 24s. to the value of 20l., what did they fetch when they were sold?—5l. 2s. 6d. the goods realised, and the auctioneer's charges were 3l. 18s. 6d.; 4s. 6d. for the warrant made 4l. 3s. to recover a fine of 10s. and 14s. costs, that makes 5l. 7s. against 5l. 2s. 6d. realised; they were 4s. 6d. short after paying all expenses.

15,083. (*Mr. Meadows White.*) Was that the occasion upon which there was furniture seized to the value of 20l.?—Yes, they could get no one to bid; people are afraid of buying things of that kind, it was only the auctioneer himself who bid for the goods, and knocked them down to his own bidding; that was really how it was done; there was a great crowd and nobody dared to buy them. I do not think they would have got them safely home if they had.

15,098. Were you obliged to have a considerable force to preserve order?—Yes, about 40 officers and men in uniform, and about six men in plain clothes on each occasion.

15,099. Is Leicester, on the whole, a quiet and orderly town?—It is very much so indeed.

15,100. Is crime gradually on the decrease?—That is so.

15,101. (*Mr. Picton.*) Have you had experience at all of the character of those who refuse to vaccinate their children in Leicester?—I have; a number of them.

15,102. What kind of people are they; do they otherwise come in conflict with the law?—No; they are chiefly very respectable people, exceedingly so, I think.

15,103. (*Dr. Collins.*) Do you know any instance in Leicester where anyone charged with neglect of the Vaccination Act has been before the magistrates on any other charges?—I do not know of any individual instances; it might be so, but I do not remember them at the present time without referring to books, and so forth.

15,104. You would be the best authority to come to upon that subject?—I could find out by referring to the books.

15,105. You do not remember one at the present time?—I cannot say that I do. There is one that comes into my mind at the present moment, however.

15,106. Perhaps you would look that case up?—I should be very pleased to do that.

"which I considered quite characteristic of syphilis. They had the primary sore of syphilitic contagion. . . . From the symptoms which the child presented, although it appeared in good health, I should have no doubt that it was the subject of inherited syphilis. . . . the symptoms which the child had two months after vaccination were very slight indeed. The child looked healthy, and I do not think that any blame attaches to those medical men." I should like to read further from the "Lancet" of February the 1st, 1873, one or two extracts from a leader on Mr. Hutchinson's paper, which is given *in extenso* in the book which I hold in my hand, "The Anti-Vaccinator," which was published in 1872-73, and the leader makes various references to it. It says: "Notwithstanding all the assertions which had been so freely made at various times, that syphilis could be thus communicated, there had never been any sound evidence of the fact until Mr. J. Hutchinson in 1871 related the history of two series of cases, in each of which primary and secondary symptoms had been communicated to several persons by one vaccinator." There is a further reference made in the

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same article: "We think, then, that the inference from the whole group of cases related by Mr. Hutchinson must be decidedly in favour of the possibility of communication of syphilis by the inoculation either of the blood of a syphilitic vacciner, or of the serum which oozes into the vesicle if the vaccinator be unwise enough to continue to take fluid after the first drop of lymph, the true product of the vaccination, has been exhausted." That is a reference which influenced me very considerably.

15,110. Did you, after reading that, determine not to have your children vaccinated?—Yes, I did.

15,111. Were you summoned in respect of them?—I was summoned.

15,112. I believe the first instance was in April 1874, your first child having been born in the previous October?—My first child Thomas was born on October 6th, 1873, and I was summoned April 24th, 1874, for its non-vaccination. I appeared in court, and while attempting to plead my reasons for the child's non-vaccination, I was stopped by the presiding magistrate, Mr. W. T. Rowlett, and fined 1*l.*, including costs. The fine was paid.

15,113. Were you again summoned for your next child in January 1876?—I was again summoned for my next child Beatrice Susannah on the 18th January 1876. I was again fined 1*l.* including costs. The fine was again paid.

15,114. And were you also fined, in June 1882, 5*s.* and 5*s.* costs in respect of your child Mabel?—I may say that my third child Florence was left unvaccinated. I received the notices and summons, but I never paid the fine. Then for my next child named Mabel Forster I was summoned on June 15th, 1882. On this occasion I was fined 5*s.* and 5*s.* costs, or in default seven days' imprisonment. I refused to pay the fine as I felt it was time to protest against such tyranny. On the 16th of the following November three policemen came and ticketed my bookcase and cheffionier for distraint. It was valued at 12*l.* or 13*l.* by a cabinet-maker. As the distress warrant was only for a total of 12*s.*, I pointed out to the police articles of less value, but they said they "knew their own duty." They performed it in a very offensive manner, and when I told them so they replied, "That is the way we do our business." On Friday, the 24th November, the police came to the house with a horse and dray and they took away the bookcase to the "Nag's Head" public-house for sale where it was sold for 7*l.* The auctioneer's fees were 3*l.* 3*s.* On the 23rd of the following May, 1883, I summoned the three police constables and the police sergeant for excessive distraint. The case was tried at the Castle, County Court, Leicester, before Mr. J. Barrow, the judge. Amongst other things his Honour said the execution was for a fine amounting to 12*s.*, and he thought it right that such a fine should be levied, but as he could not see what possible justification there could be for taking goods, even to the value of 3*l.*, though he was inclined to think they were worth 13*l.*, he should give judgment for the plaintiff for 7*l.*, the amount claimed.

15,115. (*Mr. Hutchinson.*) Was that your only objection to having your child vaccinated, that you had read this statement as to syphilis?—Not altogether. I had very great difficulty in understanding what vaccination really meant. I saw so many different modes of vaccination. I found that in some cases human lymph was used, in others horse-pox matter was used, and swine-pox matter was even used.

15,116. What class of the population are best able to judge of the danger as regards syphilis from vaccination?—Most likely it is the medical man.

15,117. Do you know how the medical men in Leicester act in reference to that themselves?—There are cases I have before me where medical men have given certificates of death through vaccination.

15,118. Medical men have children themselves, and they would do everything they could do to protect the health of their own children, and they are able to judge of the pros and cons, are they not, as regards the risks of syphilis?—It seems to me, so far as I am able to ascertain, that there is very great difficulty in trusting the vacciner as to the condition and age of the lymph.

15,119. Perhaps you have attended to the question since those cases were reported which you have read,

which was 15 years ago?—I have seen corroboration of them.

15,120. Are you aware whether there has been any case reported in the last 10 years?—I cannot say that I know.

15,121. You have many medical men in Leicester, I suppose?—Yes.

15,122. Do you know at all how many?—The number is perhaps 25 or 30 probably.

15,123. A great many more than that. Do you know at all whether they have their own children vaccinated?—The greater proportion of them are in favour of the theory of vaccination, but what process they adopt I do not know, because I find a great diversity.

15,124. Do you know at all whether any one medical man in Leicester has abstained from having his own children vaccinated through a fear of syphilis or anything else?—I believe there is one medical man in Leicester who has done so.

15,125. Could you give the Commission his name?—He resides in the London Road, Dr. Lakin, I believe.

15,126. I believe you are quite right?—I am not aware of any other.

15,127. Do not you think that is a very strong fact, seeing that medical men have their children vaccinated, they being the best calculated to estimate the danger from small-pox on the one hand and the danger from vaccination on the other?—I do not say that they are not better able to form a judgment than laymen, but laymen have to come to a certain judgment respecting it; they find their children are healthy before the operation takes place, and then a number of cases come before us in which the results are very painful to witness.

15,128. You would think that medical men were quite alive to the syphilitic cases you refer to, but still, balancing pros and cons, they have their own children vaccinated; do not you think that is a very strong fact?—It seems to be so, that they do adopt the practice, but it seems to me very difficult as a layman to know what practice to adopt. If I am to be compelled to submit to vaccination I should like to know whether I am to submit to the evils likely to arise from arm-to-arm vaccination, or to vaccination from the cow direct, or from what source; there seems to be such a diversity of opinion amongst medical men with reference to it that I cannot arrive at any satisfactory opinion with regard to it.

15,129. You do not think it safe to follow the example of medical men apart from precept?—Not in this case. Against the statistics of Leicester it would be very difficult for me to accept the statistics of vaccination as protecting. I think the statistics for Leicester from 1877 up to the present date seem to be overwhelmingly in favour of sanitary precautions.

15,130. (*Mr. Picton.*) Is it the case that all medical men in Leicester are in favour of compulsion?—No, it is not.

15,131. You know some who are opposed to it, I believe?—Yes.

15,132. What is it that you object to; do you object to anybody practising vaccination?—I object to the compulsory enforcement of it.

15,133. You wish to be allowed to use your own judgment with respect to it?—I do.

15,134. You like to use your own judgment about medical prescriptions in general, do you not?—Yes, with reference to the question of vaccination. I am of opinion that a person ought not to be compelled to submit to an operation to which he really has a conscientious objection.

15,135. You think that medical opinion should not override your own judgment and feeling?—That is so.

15,136. (*Dr. Collins.*) When you stated to Mr. Hutchinson that you were not aware of any cases of syphilis resulting from vaccination in the last 10 years you had not in your mind the case in which the Leeds Coroner's jury found: "That the said Emily Maud Child died at the General Infirmary Leeds aforesaid on the first day of July 1889, and so the Jurors aforesaid, upon their Oaths, do further say that she died from Syphilis acquired at or from Vaccination, and the Jurors aforesaid do further say that the said Emily Maud Child was a female person of the age of seven months, and a daughter of Alfred Child a

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Mr. T. Pratt. "Gamekeeper of Arthington"?—I do not remember that case.

15,137. You do not remember that case at Leeds?—I do not.

15,138. (Mr. Hutchinson.) Nor have you heard that that case has been disputed?—I had not heard of the case.

The witness withdrew.

Mr. HENRY BAILEY BRUCE examined.

15,139. (Chairman.) You are an elastic web manufacturer, residing at 113, London Road, Leicester?—I am.

15,140. You had your first two children vaccinated, I believe, without any injurious consequences?—I had.

15,141. Did your first child suffer after vaccination?—Originally I was in favour of vaccination, and in due course had my first two children vaccinated; after the birth of my third child my opinions altered respecting the practice. This child was born on the 21st of September 1870, and named Ernest. It was vaccinated at the age of five months by Dr. Sloane. It was a splendid child before the operation, but directly afterwards its arm became painfully inflamed and swollen, and the child was a great sufferer. It never recovered, but before we knew that the child would die I told my wife I would never allow any more of our children to be vaccinated as long as I lived. The child's arm was a

mass of mortification from shoulder to wrist, the skin being almost black and threatening to burst with the foul corruption underneath. As the child died suddenly about 14 days after the operation a Coroner's inquest was held respecting its death. The verdict given stated that death was due to "convulsions." "Yes," I said; "but convulsions brought on by the foul and filthy matter put into the child's system." I refused to have my next child Bertha Louise vaccinated, and was summoned on the 10th January 1879 before the Leicester magistrates for neglect. I made a defence before the Bench, telling them how my child Ernest had been killed by the operation at the age of five months, and I said I thought that this was a sufficient reason why I should be excused for not submitting another child to the same risk. The usual fine was imposed upon me. I threw down the half-sovereign with the remark to the Bench, that "if I were to have 40 more children not one of them should ever be vaccinated."

The witness withdrew.

Mr. WILLIAM KEELING examined.

15,142. (Chairman.) Do you reside at 22, Mere Road, Leicester?—Yes.

15,143. And you are sergeant of police and cab inspector?—Yes.

15,144. From 1883 to 1888 were you the summoning officer?—Yes.

15,145. And had the management of the work of summoning anti-vaccinators?—Yes.

15,146. And the control of the issue and execution of the distress warrants for the non payment of fines?—Yes.

15,147. Have you superintended the execution of the following sales by auction upon the 20th December 1883, the 24th January 1884, the 6th November 1884, and the 13th May 1886?—Yes.

15,148. You remember the dates of those, but there have been others, the dates of which you have forgotten?—Yes.

15,149. In effecting those sales had you any difficulty?—Yes, a great deal of difficulty; people are so averse to vaccination in the town.

15,150. Would the four sales you mentioned represent a number of different distresses?—I should think they would represent about 50 warrants.

15,151. Were you obliged to have a considerable force of police with you?—Yes, I had a number of uniform men and plain clothes men to go round with me to collect the goods and to follow the van, and I had to place them in different parts of the town so that they could slip from one part of the town to the other sharp, so that we should not be followed by a crowd of people.

15,152. Have you had difficulty sometimes in getting into the houses?—I had in one case to break into the house; there were with me 16 uniform men and some plain clothes men, and we had to break into the house when there were a number of people hooting and shouting.

15,153. What class of people were they generally on whom the distresses were levied?—All respectable people—tradesmen, travellers, shoe manufacturers, shopkeepers, and so on—a respectable class of people.

15,154. Used you in some cases to try to persuade the defaulters to pay?—Yes; I used to go round to the people who were about to be distrained upon, and ask them if they were going to pay the fine to prevent the distress warrant being taken out; they all had notice first before they were distrained; then there were distress warrants issued, but first I would go round and ask them would they pay upon a distress

warrant, and then they would tell us they would not pay; that they had a conscientious objection.

15,155. Have any of your children suffered from vaccination?—I had one ill for about seven years; it was vaccinated from a child whose father I afterwards heard was consumptive; it cost me a lot of money to bring it round. I have two not vaccinated now, and three I have lost; my wife got me to have them vaccinated, and she has been very much embittered against it since.

15,156. Those two not vaccinated have been born since the time when the Guardians gave up prosecutions?—Yes.

15,157. So that there have been no proceedings taken against you in respect of them?—That was so.

15,158. (Mr. Picton.) What was your ground for thinking that the child which suffered was vaccinated from lymph taken from a child of a consumptive person?—He dwindled away; he was under the doctor for about seven years.

15,159. Was there anything the matter with the arm?—No; the arm seemed to get all right, but we found out afterwards that the child's father was consumptive that our lymph was taken from, and we put it down to that.

15,160. You say that the other three children died?—Yes, the other three children died; they dwindled away directly they were vaccinated. The two I have now have not been vaccinated, and one of them is a nice child, the youngest; they are both fairly healthy children.

15,161. (Dr. Collins.) I gather from your evidence that your duties have not been very pleasant ones to perform?—Not at all; it has been a very awful duty to perform in Leicester; our people are very much embittered against vaccination in Leicester.

15,162. Of course you do not levy distress unless you consider that there are enough goods to levy upon?—That is so.

15,163. How much do you allow for costs?—5s. each, I think. This paper I have here is the warrant, and this is the paper which we put upon the goods. We do not stop in possession. We mark the goods in that way by putting that paper upon them.

15,164. The brokers charge 5s. for each sale?—Yes; it is a most difficult matter to distrain and sell. We have to go from one side of the town to the other so that we may get away with the van, otherwise we should have a crowd of people about it at once.

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15,165. Have the goods ever been knocked down to private individuals, and not offered for public sale?—I have never noticed that.

15,166. (*Mr Picton.*) Is there an unwillingness to buy them?—Yes.

15,167. How are they sold?—Some gentlemen buy them in mostly.

15,168. (*Sir Edwin Galsworthy.*) Supposing the expenses and the fine to be a sovereign in all, what amount of goods would you distrain on?—About 30s. worth, whatever would fetch the amount; if they did not fetch the amount we would distrain again to make the deficiency up.

15,169. Did you ever distrain for a very much larger

amount than the fine and the costs incurred would amount to?—Only once.

15,170. (*Chairman.*) Was that in Pratt's case?—It was.

15,171. (*Mr. Meadows White.*) Do you distrain in other cases than fines for breaches of the vaccination laws?—Yes, for rates, and in civil cases.

15,172. Do you proceed in the same way?—Yes, the very same way.

15,173. (*Dr. Collins.*) Do you find any difficulty in effecting such sales?—No trouble at all, only in connexion with vaccination.

15,174. (*Sir William Savory.*) Do people never have conscientious objections to the payment of rates?—Not that I know of.

The witness withdrew.

Adjourned till Wednesday, the 15th of April, at 1 o'clock.

## Sixty-first Day.

Wednesday, 15th April 1891.

PRESENT :

SIR JAMES PAGET, BART., IN THE CHAIR.

Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. WILLIAM JOB COLLINS.  
Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.

Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary.*

Mr. JOHN THOMAS BIGGS further examined.

15,175. (*Chairman.*) What is the next point you wish to bring before the Commission?—The point at which we left off when I was last here was this. I was about to deal with some official reports which have been made with respect to deaths occasioned by vaccination. I had just made a start upon the report of some cases which occurred in the Misterton and other districts of the Gainsborough Union of Lincolnshire and the adjoining Union of East Retford. I wish further to call the attention of the Commission to some of those cases. The official report which was published states, on page 1, that Dr. Wright—

15,176. Official report from what source?—From the Local Government Board dated the 16th December 1876. (*See Appendix IV., page 466.*) I am now calling the attention of the Commission to these reports to show the risky and careless way in which the law is carried out, which was the point I had arrived at when I was last before the Commission. It says on page 1: that "Dr. Wright, with a view to the approaching half-yearly vaccinations in his district, vaccinated five children on the days respectively stated, viz., Edwin George Baker, aged three months, on September 25th; Walter Burdon, aged five months, on September 26th; Sarah Bates, aged six months, Elizabeth Ann Doughty, aged five months, and William Mead, aged six months, on October 2nd, all of Wakeringham. The lymph employed was probably some dry lymph on 'points' which had been supplied to him on the 23rd September from the 'National Vaccine Establishment.'" As the result of those vaccinations, 16 of which were carried out from that source, there were several deaths, and in the table contained in this Report issued by Mr. Netten Radcliffe these are the results. With regard to the death of Joseph Henderson, he states that: "The areolæ had declined by time erysipelas set in, and the erysipelas did not begin apparently at the seat of the vaccine pocks." In another death which occurred,

that of Edwin George Baker, the remarks are these: "Erysipelas came on with the development of the areolæ." Then there is another death that of a child named Mary Cottam: the progress of the vaccination is described as "spurious and unhealthy throughout," and the remarks as to this case are these: "Apparently case of unhealthy wounds taking on erysipelatous action." There is another death of a child named Charles Cooper Parker, and this is described as: "A remarkably acute case, setting in 18 days after vaccination, and long after the active general symptoms of vaccination had passed away. Child was in excellent health two days before. Began in vaccinated arm." There is the death of another child, John George Woodhouse, and the remark as to that case is: "Erysipelas did not appear till the 25th day of vaccination, and after the scab had separated." Another child whose death is recorded is one named Alice Laura Scott, and the observations upon that are: "On the 6th day of vaccination. Case possibly complicated with scarlatina." In the series of sixteen cases the report states that in ten out of twelve cases in which the vaccination was more or less successful erysipelas was developed, and in the case which was spurious (Cottam's) erysipelas also occurred. I find that Cottam dies 25 days after vaccination, and although vaccination did not properly develop, erysipelas supervened and the death was given as the result of the operation. We find, therefore, that erysipelas and death resulted in this particular case from spurious vaccination. With regard to the particulars relating to some of these cases I should like to read a few short extracts from the Report to the Commission. With regard to John George Woodhouse the statement made at page 6 of the report is that, "The arm was inspected by Dr. Wright on the 17th October, but the vesicles were not then sufficiently developed to admit of lymph being taken from them, and none was taken then or afterwards. Except a little retardation in the development of the vesicles, the progress of the vaccination would appear to have been regular

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"to the time of their maturity: nor did the after-course of the vesicles present anything to arrest the attention until the 26th, when the seat of the lower vesicle, which had not scabbed like the seat of the upper one, is stated to have become inflamed. Dr. Wright, who saw the case on that day, directed it to be poulticed. After the application of a poultice, and before the close of the day, the inflammation, according to the mother, subsided. Dr. Beard visited this child, in company with Dr. Wright, the day following (the 27th October). The scabs had then come off and cicatrization was apparently proceeding normally, but slight redness was observed about the points of vaccination. Except this slight redness, nothing special was noted further by the mother until the 30th October, when she found that the child shrunk and cried when the side of the body corresponding to the vaccinated arm was touched. On the fourth day following (3rd November) a swelling in the armpit of the vaccinated arm was first noticed; about the same time it was observed that the tender side had become red and swollen. From the side the redness and swelling spread to the right shoulder and arm. On the 9th November Dr. Beard saw this case again and found great œdema of the left shoulder with erysipelatous inflammation extending over the left half of the chest. Afterwards the inflammation involved the whole of the left arm from the shoulder to the tips of the fingers and the greater part of the trunk on both sides, including the throat. Vesications appear to have formed on the breast, and there is reason to believe that deep-seated suppuration occurred in the left pectoral region. The child died on the day following (the 10th November), the redness of the affected parts deepening to a purple tint before the end came. The cause of death in this case was certified by Dr. Wright as 'Inflammation of thorax and arm, ten days [duration].'"

15,177. Is there anything you would wish to add particularly to the evidence you gave on the last occasion concerning these cases?—Yes, I want to call particular attention to the way in which the operations were carried out.

15,178. Is not that summed up by Mr. Radcliffe himself?—It is summed up at the close of the report, but it seems to me that unless the symptoms of these cases are laid before the Commission they cannot have a proper conception of the seriousness of these cases. A further series of operations were performed by Dr. Wright, and as to these the remarks that are made are of much the same character as those I have already read to the Commission. I find that of those 13 cases, 11 are described as more or less successful, one as imperfect and one as unsuccessful, so that account is only taken of 12 cases, and of those erysipelas occurred in three, that is to say, localised erysipelas, and in two excessive areolæ inflammation with enlargement of the axillary glands, and in one of those an axillary abscess followed. The erysipelas appeared on the eighth day of vaccination in one case, on the nineteenth day in another, and on the twenty-first day in another. The summing up of these cases by Mr. Radcliffe was to this effect, that out of 28 vaccinations there were 18 cases of erysipelas, of which eight proved fatal. He goes on to remark on page 13 that "In some of these cases the connexion of the erysipelas with vaccination was, to say the least, very remote. In Doughty's case there would seem to have been no appreciable connexion at all. Having thus completed, from the sources of information open to me, an account of the cases, I proceed to submit the following observations upon them. The first question which presented itself for consideration was whether the untoward results recorded were due to any careless or accidental inoculation of the infection of erysipelas at the time of the vaccination, or to any septic change which the lymph itself, though pure at the time of being taken, might have undergone in the interval between that time and its being used for the several vaccinations." He goes on to remark (on the same page): "The way in which the public vaccination had been carried on was altogether at variance with the instructions of the public vaccinator. The very important instruction to vaccinate, as far as possible, with liquid lymph direct from arm to arm was systematically disregarded. With respect to the mode of operating neither Dr. Beard nor myself had the opportunity of witnessing Dr. Wright perform vaccination, but we were enabled to satisfy ourselves that in several of the details connected therewith he was reprehensibly careless. The

"lancets he was accustomed to use when seen by Dr. Beard at the beginning of the inquiry were rusty, and when they were seen by me at a later date, though they had been partially cleaned and apparently sharpened on some coarse-grained material, I found them dirty, both blades and handles, and in a state unfit for the performance of vaccination. Some 'points' which he produced for examination can only be described as filthy. Again, it appeared that Dr. Wright had the habit of carrying mixed in the same packet, vaccine 'points' which he had recently used, and unused charged vaccine 'points.' In a packet of this sort Dr. Beard and I found two used 'points' smeared with blood at the tips, mixed with a number of unused charged 'points.' Such carelessness in regard to the performance of a delicate operation is a constant source of danger, and when it exists, if the vaccinator, in the course of his medical and surgical practice, should have been exposed to the infection of erysipelas, it is obvious that there might be opportunity for his infecting his lancets or 'points,' or the lymph with which one or both might be charged, in his manipulation of them." He goes on to remark: "It was an important question whether the lymph obtained from that child" (Burdon) "might not have become infected while it was being removed from the pocks, in the process of charging the 'points,' or of its removal on the lancet. There was, of course, the further question whether, in the hands of a vaccinator habitually not careful, the lymph, which in most cases was not used till several days after it was taken, might not, by being carried about in his pocket during the interval, or by being otherwise improperly kept, have become spoilt." He goes on to make the following remarks upon these several considerations: "In the first place the supposition that the lymph, during its manipulation by the vaccinator, could have received any infection of erysipelas is rendered unlikely by the fact, that there was not, so far as I could ascertain, at the time when erysipelas manifested itself in Baker (the first attacked of the vaccinated children who suffered from that disease) any prevalence of erysipelas in the Misterton district. . . . Secondly, the hypothesis that the erysipelas was due to the lymph having been spoiled in keeping is, as regards two of the cases affected, inconsistent with the fact that there had, in them, been no keeping of the lymph." He then goes on to refer to the case of Cottam as to which he says: "There was, moreover, but one case (Cottam) in which unhealthy action in the vaccinated spot immediately followed the operation." This was the case of spurious vaccination which I have already referred to. Speaking of the results, he goes on to say (page 14): "These unusual results, occurring together in such large proportion in the practice of one vaccinator, appear to point to some commonly operative cause beyond an accidental chafing of the pocks by a child's dress, or any individual peculiarity of a child's constitution; and this common cause is probably to be found in that habitual disregard of proper cleanliness and proper care in the performance of the vaccination which I have had to describe. The state of some of the points was eminently suggestive that something more than pure vaccine lymph was occasionally inserted." He makes one other statement here which I think is important: "So long as the pocks remained unhealed and were open sores they were liable (other things concurring) to become the seat of erysipelatous action, or of other septic mischief. The enlarged glands, too, if they should become actively inflamed, were also likely (circumstances favouring) to form the starting point of erysipelatous or other septic action." Further on (page 15) he says: "Traumatic erysipelas, however produced, is one of the most subtly infectious of maladies, and it has been a question for anxious consideration whether the child Baker, in Walkeringham, may not have been exposed to infection from the farmer in Misterton parish. I have altogether failed to establish the likelihood of such exposure." Then a further suggestion was made (page 16) that "the concurrence of scarlet fever and vaccination in the same neighbourhood may sometimes lead to erysipelatous complications. So far as this inquiry has extended, it has disclosed nothing which would lead me to infer that any of the patients affected with erysipelas were, at the time of vaccination or during its progress, infected with scarlet fever." Then, summing up the conclusions, Mr. Radcliffe says (page 17), that "there is no evidence to show that the vaccine lymph as obtained



“ from other sources conveyed such infection. That, nevertheless, certain details connected with the operation of vaccination as performed by the public vaccinator in the Misterton district, and notably the use of dirty lancets or dirtied ‘points,’ have probably exercised an important indirect effect in rendering the vaccinated children liable to erysipelas, by causing the progress of vaccination in several instances to become irregular in some of its stages.” In reading this report through (and I dare say it may have been read by members of the Commission) to my mind it presents a very painful aspect of vaccination, inasmuch as we have a series or two series of cases of vaccination, 28 in all, where erysipelas was developed in 18 almost immediately, and in which eight deaths followed.

15,179. Would it not be well to read the whole of the summary of the principal facts and the conclusions which Mr. Radcliffe drew up?—I will do that if you wish. The conclusions were thus summed up: “1. That at the beginning of this outbreak of erysipelas among recently vaccinated children the disease was not limited in attack to such children. 2. That in the vaccinated child first affected, the seizure followed close in order of time upon the occurrence of a severe case of phlegmonous erysipelas in another part of the same district, and may like that case, as the information regarding these cases stands at present, have originated otherwise than in antecedent infection. 3. That of the subsequent cases of erysipelas following upon vaccination, the erysipelas may in some have arisen from like causes as in the first case; but, having regard to the infectious nature of the disease, to the communications which occurred between the first case and the subjects of the subsequent cases through the visits made by the public vaccinator whether for inspection or otherwise and to the chances of transmissions of infection in the ordinary intercourse between the several villages and places in which cases occurred, and between the villagers themselves, it is probable that by far the greater number of the cases of erysipelas following upon the first case were produced by infection. 4. That it is quite certain that the lymph as furnished by Burdon did not convey any infection of erysipelas, and that there is no evidence to show that the vaccine lymph as obtained from other sources conveyed such infection. 5. That, nevertheless, certain details connected with the operation of vaccination as performed by the public vaccinator in the Misterton district, and notably the use of dirty lancets or ‘dirtied points,’ have probably exercised an important indirect effect in rendering the vaccinated children liable to erysipelas, by causing the progress of vaccination in several instances to become irregular in some of its stages. 6. That the irregularities in the progress of the vaccination here referred to consisted chiefly (1) in sluggish healing and occasional purulency of the pocks after the areolar stage had passed—a condition of things not admitting of being wholly explained by mere accidental chafing of the pocks by the child’s dress—and (2) in late developed mischief in the axillary glands of the vaccinated side. 7. That the unhealed pocks, forming for the most part open sores, afforded facilities for the reception of the infection of such erysipelas as was current in the neighbourhood, and for the setting up of erysipelatous or septic mischief in the sore from causes other than infection tending to such a result. Similarly, glandular irritation appeared to predispose to erysipelas, and this equally whether the irritation was consequent on vaccination, or whether it followed (as in two cases it did) upon local injuries independent of vaccination. 8. That there existed in the district at the time a peculiar tendency to the spread of erysipelas, such as is sometimes met with as existing in localities quite apart from any performance of vaccination, and of which the outbreak in August in the villages of Morton and Corringham, and at Yawthorpe, is an example.” (*See Appendix IV., page 466.*)

15,180. It would appear from that report, I suppose, that Mr. Radcliffe regarded those as the accidents of vaccination performed during the prevalence of erysipelas in the district?—We might infer that from the report, but I notice in one of the cases which is referred to that in attempting to establish the connexion between the infection of the child Baker and the existence of erysipelas upon a farm in a parish immediately contiguous, he states that he has altogether failed to establish the likelihood of such exposure.

15,181. That would not, however, I suppose, prove that there could be no such exposure?—It would not necessarily prove that there was none, but all Mr. Radcliffe’s efforts failed to establish any connexion between the two.

15,182. (*Mr. Whitbread.*) I forget whether there are any figures which show the amount of erysipelas which prevailed at that time?—There are none here; he simply states that there existed in the district at the time a peculiar tendency to the spread of erysipelas.

15,183. (*Dr. Collins.*) Does he happen to state what those tendencies were?—I am not aware that he does.

15,184. Or does he give any basis for the conclusion that erysipelas was current in the neighbourhood beyond the one case of phlegmonous erysipelas?—He fails to establish an such conclusion.

15,185. Do you find any evidence of erysipelas having been current in the neighbourhood, or of there having been a peculiar tendency to erysipelas beyond that one case of phlegmonous erysipelas, from which it was suggested that one of the cases was infected?—I do not find any such evidence; the existence of the peculiar tendency referred to seemed to arise solely from the fact that a large number of children suffered from erysipelas, and that they suffered from erysipelas as the result of vaccination.

15,186. (*Chairman.*) That would not follow from the last sentence. He speaks of it existing in the locality quite apart from any performance of vaccination?—He speaks of it as existing in the district, and he says these are special instances.

15,187. He does not give the number of cases other than these, but he merely says that there were other cases?—Yes, but those other cases were a long distance off.

15,188. (*Mr. Meadows White.*) He speaks of an outbreak in three villages?—Yes, Morton, Corringham, and Yawthorpe; the report was signed on the 16th December 1876, and it was published in February 1877.

15,189. (*Chairman.*) The vaccinations, I see, were performed in the last week of September and the first week of October?—Yes, principally in October.

15,190. The outbreak mentioned at Morton, Corringham, and Yawthorpe is from the 3rd to the 23rd of August; I suppose of the same year?—Yes, I take it so; but those villages were some distance from each other, and it appears to me that the risks of vaccination referred to in the summing-up of this report were just as considerable, even if that fact were established as though it were not in existence.

15,191. Do you mean that you think the risk of vaccination as great where no erysipelas exists as where it does?—No, I do not affirm that. I simply say it does not remove the risks of vaccination; it simply shows that, if erysipelas is in existence in a district, it probably intensifies the risk.

15,192. That was the first question I asked you, whether it does not appear that those risks were due in a great measure to the fact that erysipelas was prevalent in the district?—I do not think it is established that it was prevalent in the district.

15,193. Do not the latter sentences imply that?—They are the summing up, but in the eighth conclusion he refers to an outbreak in the locality quite apart from any performance of vaccination.

15,194. But surely he says distinctly there existed in the district at the time a peculiar tendency to the spread of erysipelas such as is sometimes met with in other districts?—To that I must say that the only peculiar tendency that I can see was the untoward result of the vaccinations in developing erysipelas. I have read this report through carefully. I have read over the sufferings of the children who died, and of some of those who managed to survive the attack; and the conclusion I came to on reading this (I could not help this thought arising in my mind) was, how did this investigation arise? It certainly did not arise through any voluntary information on the part of the operator, and the allegations of the parents were quite as true before this official investigation took place as they were afterwards. The conclusions arrived at, and I take it they will not be disputed, were these: that eight deaths followed the two series of vaccinations, and that if in regard to the deaths of those children the statement of the parent was that the death occurred from vaccination,

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I say those statements were just as true before the official investigation as afterwards.

15,195. (*Sir Charles Dalrymple.*) You rely upon the man's report, but you object to his drawing his own conclusions?—I do not object to any conclusions, I agree practically with the conclusions. I am simply now making this statement: at one of the previous sittings of the Commission the question was raised as to the testimony of the parents, and I wished to state in regard to this particular investigation that the statements of the parents were equally true before the official investigation as after. If there had been no official investigation I have no doubt a good deal of contempt would have been thrown upon the statements made by the parents themselves; but when we have it established here in official form it shows that statements may be made by parents who are not at all skilled witnesses, and stand, as I think, on an equally level footing with those that are sometimes made by medical men.

15,196. (*Sir William Savory.*) That is, that you regard statements made by parents as exactly on an equal footing with the results of official investigation?—The statement made by the parents is in regard to the sufferings of their children.

15,197. But you do not know how far that statement was exaggerated; it is confirmed to some extent, but there is no proof that it is confirmed to the whole extent?—I do not know of any exaggeration which could get beyond the fact that children die from the effects of vaccination.

15,198. It is not a question of what you know, but whether there is any discrepancy proved with the statements previously made by the parents?—The report speaks for itself.

15,199. (*Dr. Collins.*) Do you find in the report of the Gainsborough cases, to which you have called our attention, any reference to any specific case of fatal erysipelas, except in the case of the eight vaccinated children?—None at all.

15,200. Do you find any mention of vaccination upon the certificate of death in any one of those?—Not one of them.

15,201. Does the result of the official report in your mind tend to suggest that vaccination was at any rate a contributory cause?—There is no doubt of that. I think that conclusions 4 and 5 are strongly in that direction.

15,202. Do you find in the report any specific reference to any cases of erysipelas other than those in the vaccinated children tending to prove that it was current in the neighbourhood?—No specific reference whatever, only a general reference such as that contained in the 8th conclusion. There was an outbreak referred to by Sir James Paget in August in some villages in Lincolnshire, but they were altogether apart from the villages where these vaccinations took place.

15,203. (*Professor Michael Foster.*) Do you really think that Mr. Radcliffe was basing his statement that the erysipelas was not confined to the vaccination cases upon the one case that was quoted?—There was one case quoted.

15,204. Do you think that he based his statement simply upon that one case; that when he said that the erysipelas is not confined to the vaccinated children he was simply making that statement upon the ground that there had been one case of erysipelas not in a vaccinated child?—Principally he did, judging from his own statement here.

15,205. How do you mean? So far as I understand the only specific statement of a case of erysipelas is the one quoted in the report; there is also the statement about the outbreak in August in the adjoining villages; then, perfectly apart from the statement, in the summing up he states that the erysipelas was not confined to the vaccinated cases?—No, he does not state that; it is the final statement that I am referring to. He states, "That there existed in the district at the time a peculiar tendency to the spread of erysipelas, such as is sometimes met with as existing in localities quite apart from any performance of vaccination, and of which the outbreak in August in the villages of Morton and Corringham, and at Yawthorpe, is an example."

15,206. I thought there was some statement about "not confined."

(*Chairman.*) There is a kind of general statement made in the last paragraph on page 14: "The several considerations advanced do not, however, furnish a clue

"to the origin of the erysipelas among the vaccinated children. It was necessary to turn attention in another direction before this could be obtained. I have already stated that although there was, so far as could be ascertained, no general prevalence of erysipelas in the Misterton district, when the first case of erysipelas following upon vaccination occurred (Baker), there yet did exist one case of the disease at the time in the district." Then he gives that case, and further down he says "Nor was this the only case."

15,207. (*Mr. Meadows White to the Witness.*) Your information is only from the report?—Yes, only from the official report.

15,208. You have no supplementary information?—No, none at all.

15,209. Therefore the inferences which you have drawn might be drawn by any of the gentlemen sitting round this table?—Entirely. I have read something else in connexion with these cases having occurred before the year I first alluded to. The cases were first brought to the notice of the Local Government Board by a member of the Gainsborough Board of Guardians. He investigated the cases and reported upon them, and subsequently to his report this investigation was held by the Local Government Board.

15,210. (*Chairman.*) I think you had better also call attention to this paragraph on page 15: "The difficulty experienced in Greaves' case of distinguishing between the action of infection and of other causes apt to determine erysipelas is exactly the same difficulty as was met with in the cases of erysipelas following upon vaccination. After the disease had once made its appearance in the person of Baker's child, there was more or less opportunity of infecting other susceptible children. As the inquiry has proceeded, this consideration has come more and more into prominence, and cases that at first appeared to have necessarily been independent of previous infection have disappeared one after another." So that the impression left is that the more he studied the question the more he found cases which were liable to be centres of infection?—Yes, but I find that the outbreak of erysipelas he refers to as occurring in August includes one case of a vaccinated child; that is on page 16.

15,211. Then let me refer you to another passage at page 16: "Other accidental sources of infection existed in the intercourse maintained between the different villages and outlying houses, and among the villagers themselves. This branch of the inquiry, rendering from its complexity a very large amount of time necessary to follow it fully out, has been only carried on to the point of showing that the nature of the intercourse was such as to render it impossible to exclude chances of infection having been conveyed through it in a number of the cases?"—That is so stated; but the reading through of that report created in my mind a very painful impression arising from the sufferings of the children.

15,212. But the question at present is how far those children would have been affected by erysipelas if there had been no opportunity of infection by cases of erysipelas in the district?—That is only one point in connexion with the broader question as to how these numerous cases of fatal vaccino-erysipelas arose; but it is one that the inquirer himself does not appear to sufficiently clear up, because he only makes suggestions. I do not think he came to any positive conclusion showing erysipelalous infection apart from vaccination.

15,213. (*Sir William Savory.*) Have we not the right to assume from the statement made by Mr. Radcliffe that erysipelas occurred in the district independently of the vaccination?—Not beyond any statements he makes in the report itself.

15,214. But upon the statements he makes in that report?—Upon the statements he makes; I quite agree with the statements and the conclusions he arrives at.

15,215. (*Dr. Collins.*) Looking through the report, I do not find he states that there was up to the time of the first case occurring in Baker, any prevalence of that disease in the neighbourhood?—Not any.

15,216. I suppose after Baker became infected he might have become the source of infection to others?—Yes, he might have been a source of infection to others; that is just the point; that whatever dangers there are in connexion with the practice they are intensified if erysipelas prevails in the neighbourhood; I do not



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think that it removes us in any degree from risk even if it were proved that erysipelas existed in the district.

15,217. (*Sir William Savory.*) But if erysipelas is known to prevail in a district, or is even suspected, vaccination might be suspended?—But it was not suspended.

15,218. That is the fault of the man and not the fault of the system?—But, apart from the existence of erysipelas, we have a condemnation of the vaccinator here for using improper instruments, and there are other irregularities.

15,219. That is another question; it would be quite possible with due care if erysipelas prevails in a district to avoid vaccination?—You think it would.

15,220. Do you not?—I should rather doubt whether it would be possible in all cases to avoid risk of infection before the existence of the possibility of infection was discovered.

15,221. (*Dr. Collins.*) Dr. Wright was the Public Vaccinator duly appointed, was he not?—He was, although he did not hold a certificate of vaccination; I do not think it was insisted upon then.

15,222. (*Chairman.*) What is the next point you desire to bring before the Commission?—I wish now to call attention to a similar investigation which was carried on at Norwich in regard to some cases of injury and deaths alleged to arise from vaccination. The date of this report is the 21st of October 1882. This inquiry was carried out by Mr. Henley and by Dr. Airy. The report is addressed to Mr. Dodson, the then President of the Local Government Board. (*See Appendix IV., page 478.*) It commences:—"Sir, 'In accordance with your instructions of the 12th of August 1882, we held an official inquiry at the Board Room of the Norwich Union into the complaint of Mr. Lee Bliss as to the alleged deaths and injuries of certain children who were vaccinated in June last at the Public Station in Norwich by Dr. Guy, the Public Vaccinator for the Norwich Union.' He gives at page 3 a list of the children whose deaths followed, and he says: 'In four out of the above nine cases, namely, Threadkill, Tyler, Lambert, and Colison, fatal results had followed. We propose to deal in the first instance with these four fatal cases. These four children were all vaccinated by Dr. Guy at the Public Vaccination Station in Norwich; Lambert on the 6th of June, the other three on the 13th. Percy Threadkill died on 25th June'—12 days after vaccination—"of 'erysipelas,' certified by William Guy, M.D. Emma Tyler died on 26th June of 'erysipelas from vaccination'"—13 days after—"certified by John Crook, M.R.C.S. Alice Lambert died on 26th June, of 'erysipelas'"—20 days after—"certified by William Guy, M.D. Maudie Colison died on 4th July, of 'bronchitis,' certified by William Guy, M.D."—that death took place 21 days after vaccination. At page 4 the report goes on to observe: "These four children appear all to have been healthy before vaccination, and no evidence was produced to account for their illness from external causes. They came from different parts of the city, and no probable cause of the disease could be assigned, either from the state of health of their parents or of those with whom they had intercourse, or from the state of their dwellings or their surroundings. Attendance at the public station was the only condition common to all four cases." Then he goes on to describe the operations. He says: "Examining these cases individually, we find that Percy Threadkill (No. 80), a strong and healthy child, was vaccinated by Dr. Guy in the morning of the 13th of June with lymph taken on ivory points from the arm of Percy Armes (No. 44), and within a very short period, probably two hours, after its vaccination, showed symptoms of illness which ripened into malignant erysipelas, and terminated in death on the 25th of June, 12 days after vaccination. The vaccination itself was successful, but the character of the vaccine vesicles was not normal." I should like now to refer to some suggestions of Dr. Guy (page 4): "It was suggested by Dr. Guy, who attended the child at its home, that a rag soaked in castor oil, or a bread poultice, which the mother had applied to the arm, might have exercised a 'pernicious' effect. We may, however, at once set aside this theory, as the child was evidently sickening before any local applications were used." A footnote to page 4 states that: "The bottle containing the last drop of this castor oil was obtained and submitted to Dr. Klein, who, with the greatest care, tested it by means of experimental

"inoculations, but with purely negative results." The same paragraph where this castor oil is referred to concludes: "We can only attribute its ailment and subsequent death to illness contracted at the vaccination station. Evidence was brought forward by Dr. Guy to show that an elder child of Mrs. Threadkill had sores on her face, and Mrs. Threadkill admitted that the girl frequently kissed the baby. It appeared to be suggested that the baby's erysipelas might have arisen from this cause; but we found no reason to think that the sores on this girl's face were of an erysipelatos nature previous to the appearance of erysipelas in the infant. The case of Emma Tyler . . . was almost identical in its symptoms with that of Threadkill, though in Tyler the vaccination proved abortive . . . This infant was attended in its illness by Dr. Guy and by Mr. Crook, and died on the 26th of June, the day after the death of Percy Threadkill. Mr. Crook, who has practised for more than 40 years at Norwich, in describing the illness, said, 'I examined the arm. There was an erysipelatos appearance of the left arm extending from the elbow, arising apparently from vaccination. In my opinion the erysipelatos appearance arose from no blame either in the vaccinator or in the vacciner.' I have never seen such a bad case of erysipelas before or so soon after vaccination.' Having given a certificate of death from 'erysipelas from vaccination,' he stated in his evidence that 'this certificate still represents my opinion.' Mr. Crook added 'I do not think there would have been erysipelas if the child had not been vaccinated,' and, questioned as to the scratch alone causing erysipelas, he said 'If the child's arm had been scratched by a piece of glass, I do not think it would have produced the effect in this case nor so quickly.' There were two other fatal cases to which I have already alluded, that of Alice Lambert and Maudie Colison, where the symptoms appear to have been very similar, but a reference is made to the report of the inquiry in the Gainsborough Union, with which I have already dealt. "We now pass on to the other two fatal cases of Lambert (No. 41) and Colison (No. 71). Alice Lambert (No. 41) was vaccinated on the 6th of June, and was taken to the station on the 13th for inspection. The child was then quite well, and lymph was taken from its arm, on points. It sickened upon the 15th, and died of erysipelas on 26th June. It was attended by Dr. Guy, who gave a certificate of death from 'erysipelas.' The disease appears to have been of much the same type in this as in the former cases; but, as it did not commence till nine days after vaccination, the act of infection (which, if we have regard to the entire history of the outbreak, we must assume to have taken place at the station) probably occurred not on the day of vaccination, 6th June, but on the day of inspection, 13th June, when the vaccine vesicles were opened. The period of incubation, if reckoned from the date of vaccination, would be far beyond that mentioned by Mr. Netten Radcliffe in his Report to the Board on certain cases of erysipelas, following upon vaccination, in the Misterton District of the Gainsborough Union (page 14) . . . . . The case of Maudie Colison (No. 71) in some respects resembles that of Lambert. The child was vaccinated on 13th June, and was taken ill on 21st June, the day after inspection. It was attended (once only) by Dr. Guy, who, although he gave a certificate of death from 'bronchitis,' admitted, after hearing the evidence, that the child must at the same time have been suffering from erysipelas." This certificate of bronchitis was given by Dr. Guy, who was a properly qualified medical man. Now, I should like to remark as to this case of Maudie Colison, that when the evidence is given which you will find at pages 36-39 of this report (the question was raised at a previous meeting, and I shall have to allude to it probably more than once) after hearing the evidence which was the evidence of unskilled witnesses, the evidence principally of the parents, it is admitted, as it is stated here, that the child at the same time must have been suffering from erysipelas, yet the medical man made no mention of it upon the certificate of death giving "bronchitis" instead.

15,223. (*Sir William Savory.*) Where is the statement that he admitted that the child was suffering from erysipelas?—It is referred to twice, once at the top of page 4 and again on page 5, but you will find the evidence in Colison's case given on pages 36-39. On page 39 Dr. Guy, in giving his evidence, says he still attributes the child's death to bronchitis, then lower



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down on page 39: "After hearing the evidence in Colison's case, I still think the child died from bronchitis, but not so strongly as when I visited the child on the Thursday. There were a good many complications in the case, but I still think the cause of death was bronchitis, complicated by erysipelas. I am still of opinion that the bronchitis continued to death." The conclusion that is referred to there is not my conclusion, it is the conclusion of Dr. Airy, who carried out the investigation. He says that Dr. Guy admitted, after hearing the evidence, that the child must have been suffering from erysipelas at the time when he gave the certificate of its having died from bronchitis. Returning to page 5 the report states: "No evidence was given in this case to throw light upon the origin of the disease; but, if caused by something that occurred at the vaccination station, it should probably be referred, like Lambert's case, and for the same reason, not to the day of vaccination but to the day of inspection; and it must be borne in mind, in reference to this case, that for several days previous to 20th June Dr. Guy had been personally attending Threadkill and Tyler and Lambert who were suffering from erysipelas."

15,224. (Mr. Whitbread.) Might I call your attention to the very remarkable evidence elicited by Mr. Henley on page 39?—The doctor says, in answer to Mr. Henley: "The symptoms I observed down the side and stomach were not consistent with bronchitis. The symptoms described by the mother in her evidence are not consistent with bronchitis, but point to erysipelas; but bronchitis might exist at the same time." (Extract read from Mrs. Starling's evidence.) That points to erysipelas."

15,225. (Mr. Meadows White.) Does Dr. Guy say that he had observed those symptoms before the evidence was given, or was his mind directed by the examination of the witnesses to certain symptoms?—His mind appears to have been influenced by some evidence which was given.

15,226. Does it appear that he knew of the symptoms before the evidence was given?—Yes, I think that does appear. As a medical man he must have known of them.

15,227. Might we get you to read those lines from Mr. Henley at the bottom?—I have already read part of what was said in answer to Mr. Henley. Then, in answer to Mr. Grant, the witness says: "The cough is not an essential feature of bronchitis." (Extract from Dr. Walsh's book on bronchitis read.) They are general symptoms." And in answer to Mr. Chittock: "A child might have bronchitis in addition to some other disease at the same time." In further answer to Mr. Henley Dr. Guy admits that: "Redness, tension, and hardness are not symptoms of bronchitis." Those were the symptoms exhibited by the child. I wish now to refer to a part of this report which occurs on page 7, the third paragraph from the top. "With regard to the mode in which the public vaccinator had performed his public duties, no charge was brought against him by the complainants, nor did it appear, in spite of confused admissions on his part, under a very severe examination by the counsel engaged on behalf of the complainants, that he had failed in carefulness or skill in the performance of his duty. We think, however, that objection should be made to Dr. Guy's practice of using again and again the same ivory points in transferring lymph from arm to arm, for though it was stated that the same points were not used twice in the same day, and that after every day's using they were carefully cleaned, yet it is evident that some risk of septic contamination attaches to the practice; and we would repeat the recommendation which has before been given to Dr. Guy by the Board's Medical Inspector, when inspecting the work at the station, that he should discontinue the use of ivory points in his ordinary public vaccinations. It might even be suggested that some of the points which were used on the 13th June had by some accident or neglect become affected with a septic taint, which made them capable of causing erysipelas in children to whose abraded arms they were applied. But we find difficulty in understanding how, on this hypothesis, it could happen that the vaccinator, Percy Armes (No. 44), should escape being infected by the points applied so many times to its opened vesicles, while two out of four children vaccinated with those points caught malignant erysipelas, or how it could happen that Lambert's child should be infected in the act of taking its lymph, while the child Johnson, vaccinated from it, escaped, or how Girling should be

"infected while Ellen Wicks (the vacciner) escaped." Then the following paragraph states that: "The vaccinifers, from whose arms lymph was taken for the nine vaccinations under inquiry, were proved to have been then and (with the exception of Sewell, see page 5), since, in apparently good health, with good properly formed vaccine vesicles on the day of inspection. No blame is cast upon the vaccinator in respect of the selection of any of these vaccinifers." Then on page 8, the fourth paragraph from the top, it states: "Dr. Guy himself appears to have been not without suspicion as regards the vacciner, for he went to the house of Mrs. Armes to see her child; and it was deposed by two witnesses that he made use of an expression with regard to the state of health of the mother of the vacciner during her pregnancy, though he denied having used the words attributed to him. That Dr. Guy was fully aware of the gravity of the occurrence appears from his remark to Mrs. Tyler, that he 'would not have had it happen for a thousand pounds'; and also from the fact that he attended Tyler's and Threadkill's children gratuitously till their death, and gave a contribution through his wife towards the funeral expenses of the latter." Then there is an observation of Dr. Airy a little lower down, the next paragraph but one, which I should like to read: "We think that in continuing to attend the sick children at their own homes Dr. Guy may have incurred some risk of becoming himself a transmitter of infection to others." Then, proceeding a little further on, he says: "We cannot ignore the possibility that some of the later cases of erysipelas may have been due to infection brought by Dr. Guy from the bedside of one or another of the earlier cases that he was attending. But we cannot condemn a course of action which we believe to have been prompted by a feeling of humanity as well as a sense of responsibility."

15,228. (Chairman.) I think you should read the next sentence to that: "It must be observed that the occasion was altogether an exceptional one, and one for which Dr. Guy was wholly unprepared by anything that had occurred in his previous experience, and we feel that under the urgent and alarming circumstances of the case it is not to be wondered at that his action should have been less circumspect than might have been desired."—I am perfectly willing to set out if it were necessary the whole of the report in full so far as I am concerned. It is an official report of an inquiry into alleged deaths and injuries arising from vaccination, and I am only quoting passages to show that unquestionably these deaths and injuries did arise from vaccination, which official opinion no one, I presume, will venture to dispute. I shall presently arrive at the condemnation which is passed upon the Public Vaccinator, not only by the inspectors of the Local Government Board, but especially by Dr. Buchanan, for the deaths which followed the vaccinations which he carried out.

15,229. (Sir William Savory.) But it is not disputed that some deaths have arisen from vaccination?—I put in a short time ago a table of deaths which were stated to have arisen from vaccination, and it struck me at the time that Sir William Savory raised such a strong exception to them that it was necessary to strengthen the evidence I then put before the Commission.

15,230. That was a very different question, in that case it was a question of the degree of evidence upon which that statement rested. You gave there 24 cases?—Yes, in one list alone.

15,231. Was the case of Hart one of those cases?—No.

15,232. Was that child never on your list?—Never on that list.

15,233. Was Jarrom on that list of the 24?—I am not sure, but I think not. No, it does not appear there.

15,234. Not now, but was it never on the paper?—No, never at any time.

15,235. Have you 24 names without the names of Hart or Jarrom?—Yes, this is the list of the 24 names which I read. Jarrom's name does not appear upon it. You will find in the left-hand column the deaths, and in the right-hand column the injuries. There are not perhaps 24 names there, because you will find some two or three of the cases refer to two or three children of the same family.

15,236. Did you not put in a list of 24 deaths which were alleged to be owing to vaccination?—Yes, this is the list of the 24.



15,237. In the first column?—In the first column you will not find 24 names, but you will find 24 deaths referred to, because you will find that some of the names refer to two or three deaths in one family.

15,238. (*Mr. Whitbread.*) They would be members of the same family; only the surnames are given in the list?—That is so.

15,239. (*Sir William Savory.*) Do you know the name of Hart and Jarrom's cases?—Yes, I have heard of them.

15,240. Have you any opinion as to the cause of death of those two children?—With regard to Jarrom's case I have heard it reported as being alleged to arise from vaccination, and I have heard the same in regard to Hart's case.

15,241. Have you never used those two as alleged deaths attributable to vaccination?—Hart's is a very recent case. I do not remember having referred to it, except amongst a number of others; it is comparatively a recent case.

15,242. But I want a clear answer. Have you included or referred to the case of Hart or Jarrom as amongst the list of those who have died from vaccination?—Yes, I have referred to them occasionally elsewhere, but not before this Commission.

15,243. That is what I wanted to get at. Now upon what evidence did you do that?—Upon the evidence of the parents given to persons whose credibility I could not doubt.

15,244. Was not there the certificate to be examined in those cases; could not you, if you had chosen, have seen what the certificate of death said?—Yes, no doubt I could.

15,245. Why did you not do that?—I have the certificate of Hart's death here with me to-day, if you wish to see it.

15,246. Before including those two cases as cases of death arising from vaccination why did you not examine the certificate of death?—For the reasons I have stated before the Commission already.

15,247. For what reason?—That the certificate is not always a guide as to the cause of death.

15,248. Do we understand that you would give no weight to the certificate in opposition to the statement of the parent?—I should wish, as I stated before, to consider the circumstances of the case.

15,249. But you did not consider the circumstances of the case if you did not examine the certificate originally, or give any weight to it. Would it not have been fairer or more candid to have examined the certificate as well, and to have given some weight to it, instead of arriving at a conclusion without examining the certificate, from the mere statements of the parents?—If you will kindly tell me what assistance I could have derived from a certificate which told me that a child died from bronchitis or convulsions when I had reason to believe from the statements of the parents that it died from vaccination, I should know what to look for.

15,250. The certificate in the case of Jarrom did not state either convulsions or bronchitis; it stated that it died from a totally different cause, unconnected altogether with vaccination; that it died from cancer of the eye?—I knew the child suffered from something which had to do with the eyes.

15,251. Would it not have been fairer to have examined the certificate before you put it as a case of death arising from vaccination?—I did not put it as a case of death arising from vaccination. Whatever the certificate stated would not necessarily prove that vaccination had nothing whatever to do with the death.

15,252. But you have just stated that you have alluded to it as a case arising from vaccination?—I have referred to the case on the authority of others.

15,253. (*Dr. Collins.*) Would you find such information, as Sir William Savory's question points to, if you examined the eight certificates of death of the children who died at Gainsborough?—I was just about to refer to this point, that in the case of Gainsborough we have eight certificates, not one of them referring to vaccination as the cause of death, whereas an official investigation takes place proving the deaths to have been attributable to vaccination.

15,254. (*Sir William Savory.*) You ignore the certificates altogether, in fact?—No, I do not ignore the

certificates; although I should be fully justified in ignoring them after the instances cited of erroneous certificates. The whole of this inquiry is an impeachment of medical opinion, and to make each case turn on the medical certificate is to decide the whole question on the authority which is impeached.

15,255. You had not seen those certificates, but you could have done so if you had inquired?—Sir William Savory has selected one case in which I did not personally inspect, but I propose to go into a number of cases in which I shall take leave to put in the certificates.

15,256. Supposing we examine those cases as we have examined these?—Do I understand from this question that the Commission have already dissociated vaccination as being a cause of death.

15,257. Nothing of the sort?—I understand Sir William Savory is now objecting to my having included two names in a list which I may or may not subsequently submit to this Commission, and cites my not having seen the certificates as a ground why I should not include them. Whether I am correct or not it is my inference, at all events from the observations of Sir William Savory, that it has been already established that there could not have been any possible connexion between vaccination and those two cases.

15,258. (*Chairman.*) The Commission have not concluded anything yet?—But the matter has been raised by Sir William, as it appeared to me, from that point of view.

15,259. (*Sir William Savory.*) I am asking you what course you have taken?—I took both the manner and the matter of the question to convey something to my mind that certain facts or evidence have come to the knowledge of the Commission which have led them to altogether dissociate those cases from vaccination.

15,260. (*Dr. Collins.*) Do you happen to know that the Commission have been informed that Hart died from Bright's disease and dropsy?—Yes, I am aware of that.

15,261. I do not know whether you know that that conclusion was arrived at without any examination of the urine?—I understand that was the case.

15,262. (*Chairman.*) I understand that it is your intention to hand in subsequently a list of the deaths which you will endeavour to connect with vaccination?—That is so. Continuing the extracts from this report, on page 9 the statement is made in the third paragraph: "Then come the four children that were vaccinated from Percy Armes. Two of them are attacked with erysipelas the same evening and die within a fortnight; in the other two the vaccination is wholly unsuccessful. It cannot be doubted that at that moment some poisonous agency came newly into play at the station. We cannot divest our minds of the strong impression that the lymph used in vaccinating those children must have carried with it the elements of the disease which they subsequently developed." The following paragraph but one states: "That three out of these four vaccinations should have failed, in the hands of a uniformly successful operator, appears to us to betoken almost necessarily some abnormal peculiarity or contamination of the lymph. But we cannot dissociate the failure of the vaccination in the three cases (Coan, Harvey, and Tyler) from the occurrence of erysipelas in the two cases (Threadkill and Tyler), and suppose that these different results were due to two concurrent but wholly distinct causes. It is known, as appears from the words above quoted (page 5) from Mr. Netten Radcliffe's Misterton report, that the same cause which can produce erysipelas can also altogether impede the progress of the vaccine vesicle." At the conclusion of this report, page 11, the last paragraph but two, you find this: "Lastly, we find that no blame was proved to attach to the Public Vaccinator as regards the performance of his duties at the station, or to the appliances at the station itself; but we think that the Public Vaccinator should discontinue the practice of using again and again the same ivory points, and we consider that it was an error of judgment on his part to continue the vaccination attendances while he was daily visiting the first three cases of erysipelas at their own homes, without taking more than ordinary precautions to guard against the spread of infection. We also think that steps should be taken to relieve the crowding at the vaccination station." (*See Appendix IV., page 478*)

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15,263. (*Chairman.*) Do you know whether any alteration in the instructions to Public Vaccinators has been made in consequence of that report?—I understand some alteration has been made, but I could not tell the Commission what.

15,264. Is it not quoted in this report by Dr. Buchanan?—Dr. Buchanan refers in his observations to the manner in which the vaccinations are carried out. (*See Appendix IV., page 482.*)

15,265. But I referred to what you were last reading with respect to the use of points?—Yes, he does make some considerable observations upon that, and deprecates the use of ivory points.

15,266. Would it not be well to cite what he does say in the last paragraph of his report?—He says: "I must not allow this Memorandum to close without a suggestion for practical use arising out of the considerations submitted in it. The present instructions to vaccinators under contract direct that if lymph be stored on points, the lymph should be kept dry, the points being constantly well protected from damp, and the instructions further enjoin upon contractors to keep in good condition the instruments which they use in vaccinating. But I propose to add the specific instruction, 'Never use an ivory point a second time, either for the conveyance or for the storage of lymph'."

15,267. (*Dr. Collins.*) Did Dr. Buchanan investigate the matter personally at Norwich?—I do not think he did at all. His Memorandum is based entirely upon the reading of the report itself.

15,268. Apparently the inspectors arrived (at page 9) at the conclusion that "the outbreak was due to some contamination of the lymph which has escaped detection." I do not think you read that?—In the last paragraph but three on page 9 there is this statement: "We have already stated (on page 7) the reason why we do not regard the state of the ivory points as the probable cause of the mischief. The evidence before us furnishes no other clue. Believing the child Armes to have been healthy, and believing the uncontaminated lymph of a healthy child to be innocuous, we can only conclude that the outbreak was due to some contamination of the lymph which has escaped detection."

15,269. Is Dr. Guy still the Public Vaccinator at Norwich?—Yes; Dr. Buchanan seems to have been cognizant of the fact that a number of inspections of this public vaccination station had taken place; he refers to this again and again. He says on page 4 of his summing up: "I may usefully add to this Memorandum what I know concerning the liability of points, used as Dr. Guy uses them, to retain foreign matters at their ends. Taking ivory points charged with a minute quantity of a chemical substance (choosing one that is easy of recognition and that does not act on the ivory) to represent a chance foreign material remaining upon the point in practice, I observe one kind of ivory to differ much from another in the facility with which the substance can be removed by dissolving and wiping, and that one differs much from the other in the facility with which solid particles can be removed from the surface by rubbing or scraping. Hence, in the case of a point which has been used in vaccination, the removal of the last trace of animal matter is probably not an easy business. Imperfect removal of such matter must needs, unless attention is specially paid to dryness, result in the decomposition of it, and that decomposition will produce a putrid material capable of producing disease in a child who has the point moistened (with vaccine or anything else) and rubbed into its arm." The following paragraph is a very important one, and I should like also to read that; it is the last paragraph commencing on page 4 of this memorandum: "Having this experience of the difficulty of completely removing all foreign matter from an ivory point, I further think it right to record what I know of Dr. Guy's habits of care over matters of the sort. At inspection of his vaccination work in 1876, it was found to be good in some respects, but Dr. Airy did not recommend him for award, owing to his use of dirty instruments in the processes of vaccination. Dr. Airy did not recommend him at the 1878 inspection, by reason of slovenliness in the selection of lymph. Then I find that Dr. Guy at the 1880 inspection, deferring to Dr. Airy's representations and operating in Dr. Airy's presence, avoided the use of any points in the

"transfer of lymph, and that he has subsequently resumed the practice, employing the same point over and over again. I find him, in view of his ostensible amendment, and on the strength of his vaccine scars being of good quality, of the kind that indicate good protection against small-pox, recommended for award from the Parliamentary Grant. But when after this it occurred to the National Vaccine Establishment, in the hope of amplifying their customary store, to invite from Dr. Guy specimens of his lymph, a great majority of his tubes were found to contain blood, and were not sealed; the liquid contained in one tube was not coagulated by heat. The establishment of course declined any dealing with Dr. Guy, and put Dr. Airy in possession of the facts, in preparation for his next inspection of Dr. Guy's station." (*See Appendix IV., page 482.*) The fact that after examination the lymph contained in these specimen tubes was found by the National Vaccine Establishment to be entirely unfit for use, is a sufficiently severe condemnation of the practice of Dr. Guy as a Public Vaccinator; and obviates the necessity of any further animadversions on my part. There is a statement made by Dr. Guy from which I should like to read one or two extracts. One has been already alluded to by the honourable Chairman.

15,270. (*Chairman.*) Where is that?—At page 55. Dr. Guy puts in a statement, and in the concluding passage, if I might read this first, he says: "he refrains from making any observations upon matters which are beyond the scope of this inquiry (although alluded to in the course of it), in deference to the opinion expressed by J. J. Henley, Esq., the presiding Inspector." In this statement he says: "That in addition to appointments previously held by him, he has filled that of Public Vaccinator for Norwich about nine years. That the average of vaccinations at his station have been about 1,200 annually. That this is the first complaint made against him as to the discharge of his duties in such office. That he has twice received substantial rewards on the recommendation of Dr. Airy, Vaccination Inspector, for successful and efficient vaccination. That Dr. Airy has from time to time witnessed his method of operating, and he (Dr. Guy) has never omitted to observe and act upon all suggestions made by Dr. Airy to him." I should like that to be taken in connexion with the statement by Dr. Buchanan, that the operation as carried out by Dr. Guy at the time Dr. Airy visited him was not the usual mode of procedure adopted by Dr. Guy. Then he says: "That he has, according to the best of his judgment substantially, although perhaps not literally, obeyed the orders and instructions of the Local Government Board with regard to vaccinations." In reference to that we might compare what Dr. Buchanan says, and we might also compare some of the evidence Dr. Guy himself gave in regard to the examination of children, in which Dr. Guy admits that it was his usual practice to make only a very ordinary examination, and not such an examination as was insisted upon by the regulations of the Local Government Board. Then he continues at page 55: "That with reference to the present inquiry, he much regrets he cannot make any suggestion as to the cause of the appearance of erysipelas after vaccination beyond the general one, that such disease will occasionally follow vaccination, notwithstanding the exercise of the greatest care and caution on the part of the operator." Then at the bottom of this page he says: "That he made such a substantial examination of each child presented for vaccination as to satisfy him that such child was in a fit state of health to be operated on, and also exercised the greatest caution in the selection of vaccinifers." Then if you turn to pages 12 and 13—on page 12 you will find towards the bottom of the page—Dr. Guy says in his evidence: "In such cases I do not consider it necessary to make notes; they are of no assistance to me in such cases; doing so would not be superfluous; they would, I presume, be of some assistance. On the 13th of June I looked at the child to see if it had thrush; I did not have the child stripped. I did not look for anything but thrush. The skin was clear. I did not examine behind the ears for eczema. I did not examine the whole of the skin; the child's arms and neck were bare; this was the extent of my examination." And then on page 13 he gives a further reference to this examination: "I made an examination of this child" (Threadkill) "on the 13th of June, but I cannot say how. I have made no alteration in my system of vac-



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"cination since that date and the present time. I am not making a more careful examination of the case. When a child is brought to me for vaccination, I ask if it is healthy, whether it has got thrush; nothing else. I frequently ask whether it has a skin disease." Now I should like to call the attention of the Commission to this answer of Dr. Guy particularly, for this reason. These questions appear to have been addressed by Dr. Guy to the parent of the child brought to him for the purpose of vaccination. So far as I can judge from his own statement, he rests his examination entirely upon the opinion of the parents; therefore in his judgment the opinion of the parents was conclusive in regard to this matter. I do not know whether parents may be considered proper judges of children for the purpose of vaccination, I should have thought that was a matter for the Public Vaccinator, but if his examination consisted simply of inquiries made of the parent, then I say he most decidedly failed to carry out the regulations of the Local Government Board in respect to vaccination. Then he says lower down on the same page: "The examination I make when a child is presented to me for vaccination is not to have them stripped. I look at the legs, and look at them generally. I turn up the legs and look behind the knee, and I frequently look at the nates. I frequently look behind the ears; I do nothing more. I do not examine for irritation of the bowels, or for signs of fever; I do examine for eczema, but not specially. If I complied with the instructions of the Local Government Board, I ought to have the children stripped, and this is the only exception. I wish to withdraw my answer with respect to examining a child for fever; I now say I do examine the child for fever by an examination of the pulse, the mouth, and the skin; I do not take the temperature; I consider it the best test of fever. I do not employ the thermometer; it would occupy five minutes in each case; I do not employ it in private cases of vaccination. I consider that I comply generally, but not specifically, with the requirements of the orders of the Local Government Board; I will, however, in future endeavour to be more careful." There is only one other reference that I wish to make to this report. At page 14 Dr. Guy says, a few lines down the page: "I do not know that the Local Government Board prohibit lymph which is thin and watery; I have read their instructions as to this, but I can't say how long since." And lower down, about the 20th line, he says: "I am not aware that Dr. Jenner has stated that erysipelas is one of the proofs of true vaccination; I did not state in my certificate 'erysipelas after vaccination'; I have had no instructions to do so; other medical men give different certificates. I have not seen any of the Registrar-General's Returns during the last five years; I do not know there is a column with separate heading for erysipelas after vaccination." Further on he says: "I should in similar cases to this have always given the same certificate." Then at page 34 there is this, which is closely allied to that extract, he says, towards the bottom of the first paragraph, in reply to Mr. Grant: "In Lambert's case, I believe if the child had not been vaccinated erysipelas would not have supervened and followed. The same answers would apply to the cases of Threadkill and Tyler. That fact does not suggest anything to my mind as to the cause of the erysipelas. I have no theory in my mind in Tyler and Lambert's cases as to cause of erysipelas. In Lambert's certificate I did not think it necessary to add erysipelas from vaccination. If I had any cases presenting precisely similar appearances to Tyler's case, I should have returned it as death from erysipelas. In similar cases I have not added the words 'Erysipelas from Vaccination.' In future, if I have cases similar to Threadkill's and Tyler's, I should state in the certificate that death arose from 'Erysipelas after Vaccination.'" I do not know what possible modification of the extracts that I have read from this book would accrue if we were to read the whole of the report; to my mind the salient points are that there were four deaths following vaccination, and upon only one certificate was "vaccination" stated; yet Dr. Guy, the operator who gave the certificate of death, states himself that if in future he had similar cases he should state upon the certificate that the death arose from erysipelas after vaccination. Bearing this in mind, there is the other matter that I alluded to in regard to the other report, that is, the accuracy and reliability of what has been called "unskilled evidence." And this inquiry did not come about at the solicitation of the operator himself, but the

inquiry was held at the instigation of, and the information sent by, Mr. Lee Bliss, of Norwich. He, I suppose, with the parents would judge, although unskilled witnesses, that this death did arise from vaccination, and I must repeat what I said before, that the statement of the parents that the children died from the effects of vaccination was equally true before the inquiry as it was proved to be afterwards.

15,271. (*Dr. Collins.*) I think you might read what was said by Dr. Guy in reply to Dr. Airy, as to the cleansing of the ivory points, on page 53?—At page 53 Dr. Guy, in reply to Dr. Airy, said, "The ivory points which are now in use have been in use about three or four months; I think I had a box full quite new three or four months ago, and I at once began to use them, and have given them away. The points used in the cases under inquiry were used about six weeks or two months previously to being used to vaccinate the children the subject of this inquiry, or they must have been new; I do not use the same points more than once on same day; when a point is once used I put it into a saucer; after use I put a point into water and rub it on a towel, then rub it on emery paper, then put it into water and rub it on a towel again, and before using it again I put it into water and wipe it on a towel." Then I wish to refer to a passage on page 55. Dr. Guy states: "That the average of vaccinations at his station have been about 1,200 annually." The point which I should now raise upon that is this; that if there had been 1,200 vaccinations annually performed by him, and it was proved again and again by the inspectors that there was this use occasionally of impure lymph and of ivory points, which were condemned so strongly as you have heard, I simply put it as a matter for fair consideration as to whether anyone could believe that that number of vaccinations could possibly take place annually at the hands of one who is described as being a fairly skilful operator, but who is proved to have been very slovenly, without a much larger number of disasters following it than has ever been brought to light. We have a much larger number of cases than the inquiry itself alludes to, and, as I have said, this inquiry was brought about by a communication from Mr. Lee Bliss which led to the investigation made by the Local Government Board.

15,272. (*Chairman.*) Is there any evidence given that there were a much larger number of cases of injury than those actually forming the subject of inquiry?—No, but I maintain it is a reasonable conclusion.

15,273. Then that is simply an inference?—Yes, an inference arrived at from the way in which the operations were carried out contrary to the regulations of the Local Government Board.

15,274. There is no evidence bearing upon that?—There is no direct evidence upon that, but no one will affirm that every case of injury has been the subject of official investigation.

15,275. (*Professor Michael Foster.*) There is a statement, is not there, that this is the first complaint made against him?—He states: "That this is the first complaint made against him as to the discharge of his duties in such office"; but it is obvious from the memorandum by Dr. Buchanan that he had been very much in fault before although no public complaints had been made.

15,276. (*Chairman.*) There is no evidence that any other evil effects had followed?—There is no evidence as to that in this report. This report was, of course, confined to the cases which were under investigation at the time.

15,277. It is evidence given in public—a large number of persons were examined; do you find mentioned any other cases in reference to Dr. Guy?—No; the witnesses spoke specifically as to certain cases which were under investigation.

15,278. Surely the inquiry would have brought out such cases if they had existed?—They do not go into any such other cases. Dr. Guy himself states "that he refrains from making observations upon matters which are beyond the scope of this inquiry."

15,279. (*Sir Charles Dalrymple.*) What you mean is that we may infer that in consequence of these cases there probably were many other cases of a similar sort. Do you observe the expression which is used by the inspector in the third paragraph from the bottom of page 10, in which there is a reference to their having been no previous complaint; "there has never up to



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"the present time been any public complaint of injury having arisen to any of the 10,000 children he" (Dr. Guy) "has vaccinated"; and then the next sentence follows: "In this fact we see good ground to feel generally satisfied with the existing practice; and while we deplore the disastrous occurrence into which it has been our painful duty to inquire, we are yet happy to think that such an occurrence is of extreme rarity"?—Yes, no public complaint, but we might conclude that paragraph.

15,280. You were about inviting us to draw the inference that because these sad cases occurred there must have been many more, but I am not aware that you read the Commission that paragraph from the report?—I did not read it; if I had read it I should have completed it by reading the passage which says: "It is no new discovery that there is a certain risk attending vaccination, but that risk is shown, by the figures here given, to be very small." This rather suggests than disproves, there might have been private cases of suffering.

15,281. (Dr. Collins.) As touching the frequency of such occurrences, are you aware of any recent investigation in the same neighbourhood somewhat in a similar direction?—I have heard of some similar cases there; but the report has not yet been published, at any rate it has not come into my possession.

15,282. It is not the same vaccinator, I believe?—I am not sure; I believe Dr. Guy is still the Public Vaccinator of Norwich.

15,283. But these cases, I believe, were not within his district?—I believe not. The point I want to establish here is that these cases came up simply from the belief of the parents and of those connected with them that the children's deaths had occurred from vaccination; and if it had not been for Mr. Lee Bliss, or someone on that occasion, bringing the matter forward, I suppose even those four cases would have been passed by and been comprised within the other 1,200 cases in the year they were performed in, without any other observations being made. I do not think it would be possible if we were to take the whole of this official report for anyone to read a more damaging report of a Public Vaccinator or of public vaccination than this.

15,284. (Professor Michael Foster.) But would not the case of Tyler have been inquired into?—I do not think so.

15,285. I believe the Local Government Board always inquire into any cases in which the death is alleged to have arisen from vaccination?—I believe they say that now, but I do not know that that was the practice in 1882. The one death, of course, will be included in the number registered by the Registrar-General as erysipelas following vaccination, but I do not know that any particular inquiry would have been held in consequence of that certificate being given.

15,286. (Dr. Collins.) Was it the practice of the Local Government Board at that time to institute inquiry into such cases?—I do not think it was at all.

15,287. (Mr. Whitbread.) Do you know if Dr. Guy has continued to be the Public Vaccinator at Norwich?—He is the Public Vaccinator now, and he has since these disasters occurred received an award, I believe, for excellent vaccinations; but if the awards were given under the same circumstances as those alluded to by Dr. Buchanan, then there is no guarantee of them being given as the reward for excellency of work.

15,288. (Sir William Savory.) Where does Dr. Buchanan say that Dr. Guy has had an award?—At the top of page 5: "he has subsequently resumed the practice, employing the same point over and over again. I find him, in view of his ostensible amendment, and on the strength of his vaccine scars being of good quality, of the kind that indicate good protection against small-pox, recommended for award from the Parliamentary Grant."

15,289. But that is after the change; that is a very different thing?—It says "in view of his ostensible amendment."

15,290. (Dr. Collins.) Do you observe that on page 13 Dr. Guy states: "I have received rewards from the Local Government Board for efficient vaccination; in 1874 it was, I believe, 66l. 5s. for Norwich; the second was in 1880; I think it was 122l. 3s. awarded to me by Dr. Airy. The cases vaccinated by me have, I believe, been properly performed. I consider my vaccinations efficient vaccinations, though

"perhaps not entirely in accordance with the instructions of the Local Government Board."

15,291. (Chairman.) What is your next point?—I wish now to refer to the report of Dr. Barry to the Local Government Board upon a death which was alleged to have been caused by vaccination in the northern district of the Derby Union. (See Appendix IV., page 484.)

15,292. What is the date of that report?—29th November 1882; it is published upon the 20th December 1882. It states at the commencement of page 1: "In consequence of local information of the occurrence of a death which was alleged to have been caused by vaccination at Derby, I was directed by the Board on November 17th to institute an inquiry into the circumstances of the case. I accordingly proceeded to Derby, and at once placed myself in communication with Mr. Legge, the Public Vaccinator of the district in which the case had occurred, and obtained from him his vaccination register containing the particulars of the case in question. I also took possession of the lancet with which he was in the habit of performing his public vaccinations, and a needle with which he opened the vesicles on the eighth day. The case to which attention was drawn was that of a child named Edith Chalkley, of 3, West Row, Darley, who was vaccinated by Mr. Legge on the 13th September, inspected on the 20th September, and who died on the 13th November, the cause of death being certified by Mr. A. O. Francis, M.R.C.S., as from 'Abscesses (two months), Exhaustion.'" Dr. Barry then goes on to give a brief history of the case: "The child, who was then three months of age, was taken to the vaccination station in Lodge Lane, Derby, on the 13th September, and was there vaccinated by Mr. Legge on the left arm in three places. The vaccination went on all right in two places, but the third did not seem to come forward properly. The child was again taken to the station on the following Wednesday (September 20th) for inspection, and Mr. Legge then opened the places with a needle and took matter (lymph) from two of the places (vesicles). He did not ask any questions or examine the child's person prior to taking the matter. There was at the time little or no redness about the place where the child was vaccinated, but two days afterwards (22nd September) a rash (red pimples and wheals) came out over its body, and the left arm inflamed from the elbow to the wrist and became hard and painful. During the same week a lump began to form in the left armpit, which gradually increased to the size of a duck's egg, and eventually burst, discharging a quantity of matter. On the 29th September, abscesses began to form on both sides of the neck, and these eventually broke and discharged. About the beginning of October, she noticed" (this is the statement of the mother, I presume) "the inflammation spreading across the back to the right arm. This was succeeded by a swelling under the right armpit, and at the right elbow, and by the end of the first week of that month (October) the latter swelling broke and continued to discharge matter until the 30th October, when a piece of gristle was expelled. The abscess under the right armpit also broke and the child died from exhaustion on the 13th November, exactly two months from the date of vaccination. At the time of her death lumps, which were apparently abscesses in process of formation, also existed in the back and groins. The vaccination places had in the meantime dried up. Mrs. Chalkley further stated that both she and her husband had always enjoyed good health." Dr. Barry further says that: "Mr. Francis was unfortunately" (this was the gentleman who gave the certificate of death) "not able to give me very much additional information, as owing to the fact of its being a dispensary case, he had not kept an account of the visits or treatment. He stated that he treated the child for abscesses in the axilla, neck, and right elbow; that so far as his memory served him, there was no erysipelas when the child was first brought to him, but that he did not make a full and particular examination. He did not consider that the child was suffering from syphilis; he did not see it after 6th November. The child was clean and well cared for." He goes on to say: "The above imperfect account gives all the information that I was able to obtain with regard to the history of Edith Chalkley's illness, yet imperfect as it is, the symptoms were apparently those one would expect to find in a case of septic infection, resulting either from



"an inoculation with active septic material, or with the 'infective products of inflammation.' Then there is a list of vaccinations given here in which several children appear to have suffered, but there was only one death, that of Edith Chalkley. There is one case here which perhaps I should refer to at page 4: 'Tarr, Arthur C. E., aged 2 years. Vaccinated 20th September from Swan. Inspected 27th. The mother stated that the child suffered from a rash about a month after vaccination, for which she blamed the operation, and that since then he had become very weakly and had had lumps in different parts of his body. In consequence of its condition, Mr. Legge (her medical attendant) had procured its admission into the Children's Hospital, where it was at the time of my visit. Upon inquiring of Mr. Legge the nature of the child's illness, he informed me that when he was first called in it was suffering from chicken-pox, which was succeeded by erythema nodosum, and this he attributed to poor and insufficient feeding.'"

15,293. (*Professor Michael Foster.*) Dr. Barry recognises that as erythema nodosum, he says: "I saw the child at the hospital and found it to be suffering from what was apparently well marked erythema nodosum, a disease in no way attributable to vaccination?"—That is so. Then at the bottom of page 4 he says: "From the above notes it will be seen that of the 30 cases with regard to which inquiries were made in 25 the results of the vaccination were perfectly normal, and that of these one subsequently died of a disease unconnected with vaccination. Of the remaining five, the operation was unsuccessful in one case, two had removed out of the district and could not be traced, one was the case with regard to which this inquiry was directed, and the last suffered from erysipelas, which, from the history of the case, was doubtless due to direct contagion from a previous idiopathic case of that disease."

15,294. (*Chairman.*) There does not appear to have been more than one who really suffered from vaccination?—You will find on page 4 there is the case of a child, Martha Alice Topham, certified as dying from "Marasmus," but the observation is added that the disease had no connexion with vaccination.

15,295. That is probable?—I do not think I observed that there were several cases that suffer from vaccination, but that there were several cases suffered after vaccination. I do not wish to imply that that was the result of vaccination, but I see several marked which did suffer in some way or other.

15,296. (*Dr. Collins.*) The child dying of Marasmus on the 1st November appears to have been vaccinated late in September, and to have been taken ill about the beginning of October?—That is so.

15,297. (*Sir William Savory.*) Are we to understand that when you speak of children suffering after vaccination, you do not at all mean to imply that it was from vaccination?—I do not, in this instance.

15,298. In others?—Yes, in some I do.

15,299. How are we to understand which are the cases in which you do as distinguished from those in which you do not?—If I had understood them to have died from the effects of vaccination I should have read the cases relating to them in the report.

15,300. (*Mr. Meadows White.*) As far as one can trace it there is only one case in the list where death is attributable to vaccination?—That is all, and that is the only case I am referring to. At page 5 Dr. Barry says: "With regard to the performance of the operation by the public vaccinator. Mr. William Legge, M.R.C.S. and L.S.A., was appointed public vaccinator for the north district of the Derby Union on the 24th August of the present year. He does not hold a certificate of proficiency in vaccination, such certificate not being requisite in the case of practitioners registered before 1st January 1860, and Mr. Legge was registered on 1st January 1859. In accordance with his contract he attends at the Wesleyan School-room in Lodge Lane every Wednesday from 2 to 3 p.m. I had an opportunity of personally inspecting his mode of work on the 22nd of November, and as this is peculiar I will proceed to describe it. The instruments ordinarily used by this gentleman for the transfer of lymph from child to child consist of (a) an ordinary lancet; (b) a needle fixed in a handle; (c) capillary tubes; (d) small squares of glass. Having selected a vaccinator Mr. Legge opens the vesicles with the needle, and then collects the lymph in ca-

"pillary tubes; these are placed on the table unsealed, and as each child comes up for vaccination the contents of one of the tubes is blown on to one of the small squares of glass, the lymph is taken from the glass square by means of the lancet, and the vaccination is then performed by scratching the child's arm with the charged lancet. Mr. Legge stated that he used the capillary tubes over and over again, although not knowingly at the same sitting, and he says that he always submits them to a careful cleansing with water before using them a second time. On the date of my inspection the vesicles were opened with a lancet, as I had forwarded the needle to London for examination. Mr. Legge further stated that up to the beginning of November, he was in the habit of blowing the contents of the tubes directly on to the lancet with which he operated, without the intervention of the square of glass. If all the lymph so collected is not required, the tubes are sealed up and reserved either for future use at the station or for transmission to other practitioners. I obtained some of the tubes which had been charged on the 8th November and reserved them for future examination, and to them I shall again have occasion to refer. I also took possession of such capillary tubes as were used for taking lymph on the 22nd inst., before, however, they had been submitted to any cleansing process. The course of procedure above described, even if it were carried out with the greatest possible care and with the most scrupulous attention to the cleanliness of each unit of the complicated apparatus used, undoubtedly affords peculiar facilities for the contamination of the lymph by foreign matter, and without having, as far as I can see, any advantage over the ordinary method. The lancet and needle ordinarily used and the above mentioned charged and uncharged capillary tubes were submitted to Mr. Farn of the National Vaccine Establishment for examination on the 23rd inst., and on the 24th November he reported as follows:—'The lancet is found to be without a point, 'rusty and dirty; the vesicle-opener also rusty and 'dirty. The fine tubes which profess to be uncharged (and concerning which the statement is made that they, or some of them, have been used for taking lymph but have not been since cleansed) are found to be empty and clean, with the exception of one, which contains some albuminous matter coating its interior. Along with them was a charged tube, of which the ends had been melted but not sealed, and from which the greater part of the contents had escaped, dirtying the exterior of the empty tubes. Two tubes marked as charged from 317 contained each a small quantity of opaque lymph, one also a little blood. They were sealed. Two tubes marked as charged from 318 contained each a small quantity of opaque lymph, slightly bloody, and were not sealed. Another tube containing lymph, of which the source was not recorded, contained a small quantity of opaque lymph, and was not sealed.' If the instruments were habitually in the condition described above the possibilities of the inoculation of septic matter at both the periods of vaccination and of opening the vesicles, are endless. The repeated use of the same capillary tubes is also a most dangerous practice, as it is extremely doubtful whether it is possible to cleanse such tubes effectually after they have been once used. I have already pointed out the non-observance by the public vaccinator of the instructions with regard to the examination of both vaccinifers and vaccinees, and to this I must add that Mr. Legge disobeys the instructions laid down for public vaccinators by a habit that he has of vaccinating children who are suffering from eczema, in the hope of curing the eczema. On the date of my visit to the station five children appeared for inspection and some seven or eight for vaccination. As, however, the vesicles in three of the five cases were surrounded with a slight areola, I suggested that those children should not be used as vaccinifers, and that Mr. Legge should obtain a fresh strain of lymph from the National Vaccine Establishment. I directed Mr. Legge in future to carry out strictly the instructions of the Board dated 29th July 1871, and also to vaccinate directly from arm to arm. In conclusion I have the honour to submit the following summary of the principal facts noted respecting the child Edith Chalkley and the conclusions arrived at from the inquiry. 1. That from the history of the case of the child Edith Chalkley there is a strong possibility that she suffered from

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" septic disease. 2. That the disease was probably communicated to her at or about the period of inspection. 3. That it is quite certain that the lymph furnished by Watts did not convey any septic infection and that there is nothing to suggest that other lymph in use at this time conveyed any such infection. 4. That Mr. Legge's method of transferring lymph by the needless intervention of tubes and glasses, his use of dirty instruments, his practice of using the same capillary tubes again and again, and his habit of storing lymph in unsealed tubes, afford numerous opportunities for the introduction of septic matter into vaccinifers, and into children presented for vaccination. There is no direct evidence of the way in which septic infection was communicated to the child Chalkley, but there can be very little doubt that it was inoculated into that particular child from some

" dirty appliance used by Mr. Legge. 5. That the public vaccinator has rendered himself liable to grave censure for the erroneous entries in his register, and for his manifold disobediences to the Board's instructions of 29th July 1871." (*See Appendix IV., page 484.*)

15,301. (*Dr. Collins.*) Did any criminal action result from that information?—I am not sure as to that.

15,302. Will you look that up and let us know next time?—I will endeavour to do so.

15,303. (*Professor Michael Foster.*) Do you know how the attention of the Local Government Board was drawn to this case?—From local information. The report states: "In consequence of local information of the occurrence of a death."

Adjourned till Wednesday next at 1 o'clock.

## Sixty-second Day.

Wednesday, 22nd April 1891.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary.*

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Mr. JOHN THOMAS BIGGS further examined.

15,304. (*Sir William Savory.*) May I call your attention to your answer to Question 15,178. You say that "The summing up of these cases by Mr. Radcliffe was to this effect, that out of 28 vaccinations there were 18 cases of erysipelas, of which eight proved fatal." Why do you say "28 cases"?—There were two series of vaccinations, the first was a series of 16, and the second a series of 12 cases, making a total of 28.

15,305. But how do you make your number of twelve out of the second series?—The second series, as I think I explained, mentions 13 names, but one of them, the thirteenth, is called "imperfect," and that was eliminated from the series.

15,306. Have you this Misterton report before you?—I have. (*See Appendix IV., page 466.*)

15,307. Will you look at page 11, "I have now to describe certain cases of erysipelas following upon vaccinations," and then the report proceeds, "These cases have been, to the present, four in number, and all have taken place while this inquiry was in progress." You include those four in the 18, I suppose, do you not; they are part of the 18 cases?—If they are part of the 18 I should include them.

15,308. But you see it does not say out of how many cases those 18 cases of erysipelas occurred. The first part makes a definite statement of the number of cases in which there was vaccination, 24 or 25 I think; then you add those four, making 28, but you see they are out of an indefinite number of cases, this does not limit the number of cases to 28?—But I have taken the 28 cases in this way. On page 2 of the report I have 16 cases given consecutively, and then at page 9 of the report, there is another series of 13 cases, one of which is marked as an "imperfect" case, and that is eliminated, so that it makes 28 without that one.

15,309. If you have eliminated the imperfect case in the second series you ought to have eliminated the

imperfect case in the first; have you not eliminated the imperfect cases in the first list and so made the 14, and then added the other four to make the 18?—There is a case of abortive vaccination, that of Wilby Wilson, No. 11; I have not eliminated any from those 16.

15,310. I do not quite follow how you get your number 28?—Because there are 16 in the first list, and there are 13 in the second, but only 12 if you eliminate the one which is marked "imperfect"; that is the only one in the whole of the two series which is marked "imperfect."

15,311. Where is that?—It is on page 9; the vaccination of Elizabeth Ann Doughty, of Walkeringham, is described as "imperfect."

15,312. There is no evidence that the number was limited to the 28 out of which those cases arose?—I take the 28 which are published.

15,313. But it does not follow that the number is limited to the 28, because here is a distinct statement upon page 11: "These cases have been, to the present, four in number." I presume you have included those, but it does not say out of what number of cases those four have been taken. It is clear, as far as Dr. Wright is concerned, he had 24 or 25 cases, so I assume you have taken 24 of Dr. Wright's cases and then added those four to make the 28?—Would you kindly read the passage before that on page 11. It says, "I have now to describe certain cases of erysipelas following upon vaccinations performed by other medical men."

15,314. Yes, "one of the cases occurring in the Misterton district, the others in neighbouring parts of adjoining districts. These cases have been, to the present, four in number"; but it does not say out of how many vaccinations those four arose?—I think I am right in saying that the 28 cases to which I allude were all cases of vaccination by Dr. Wright, whereas the



reference you are making now is to cases of vaccination by "other medical men." The only medical man whose practice is dealt with in this report is Dr. Wright, of Walkeringham.

15,315. (*Dr. Collins.*) Would you read the headings at the top of Tables I. and II. respectively?—Yes.

15,316. (*Sir William Savory.*) Would you allow me for a moment, as we are on that, to refer you to page 12. The lower part of it. You see Mr. Radcliffe's statement is, "The cases last related make the total number of instances of erysipelas in children who had recently been vaccinated (which have come to my knowledge during the present inquiry) eighteen, and of these eight have ended fatally." That is exactly your statement?—Yes, that includes those four. I think what you wish to show is that instead of 28 vaccinations there would be 32?

15,317. (*Chairman.*) No; there might be more, because the four were four cases in which there was erysipelas; but it not appearing out of how many cases of vaccination those four cases of erysipelas have grown, it is suggested that the 18 cases of erysipelas were not out of the 28 cases or even of the 32, but may have been out of considerably more cases of vaccination. That is, I understand, the point suggested?—It may be so.

15,318. (*Sir William Savory.*) It is an indefinite number I think?—Under any circumstances there are six deaths in the first table which is published, and two others are mentioned subsequently.

15,319. But do you represent that those six deaths were all of them from erysipelas due to vaccination?—Unquestionably, I take the report as it stands.

15,320. But the report does not say so?—The 28 cases I have alluded to were cases I have already described, 16 in the first table and 12 in the second; and then I take the statement of the report that there were 18 cases of erysipelas amongst those who had been "recently vaccinated," and that of these eight had ended fatally.

15,321. But Mr. Radcliffe expresses it in this way: "the total number of instances of erysipelas in children who had recently been vaccinated." He words it in a different way—as indicating the accident of erysipelas occurring in children who had been vaccinated; he does not say those all died in consequence of vaccination?—He may not directly state that, but the report proves it. Dr. Collins wished me to read the headings of the tables. "Table I. Showing the names of the children vaccinated by Dr. Wright, probably with lymph taken on the 3rd October 1876 from Walter Burdon, and some of the more important facts of the cases." Then at the head of Table II. it says: "Showing the names of children vaccinated by Dr. Wright, during October and November 1876, with lymph other than that taken from Walter Burdon, and some of the more important facts of the cases." I think that clearly proves that the number of cases dealt with are solely those of Dr. Wright's vaccination.

15,322. (*Dr. Collins.*) Is there anything in the report which seems to imply that there were any other children than those mentioned in Table I. "vaccinated by Dr. Wright, probably with lymph taken on the 3rd October"?—I do not think there is.

15,323. (*Chairman.*) At page 11 it begins: "To this point attention has been wholly occupied with the vaccinations performed by Dr. Wright in the several villages of the Misterton district since the 26th September, and especially with such of them as have been followed by untoward results. I have now to describe certain cases of erysipelas following upon vaccinations performed by other medical men." Then there is a statement of the number, giving certain names. Then he says at the bottom of page 12: "The cases last related" that is to say, cases of children vaccinated by other medical men than Dr. Wright, "make the total number of instances of erysipelas in children who had recently been vaccinated (which have come to my knowledge during the present inquiry) eighteen." Does not that show clearly that the 18 were not taken out of the 28, but were taken out of the 28 plus the others which had been performed by other medical men?—It might possibly bear that inference.

15,324. "The cases last related" are those which were not vaccinated by Dr. Wright, are they not?—That does appear so.

15,325. Then if the "cases last related" make the total number up to 18, of which eight have ended fatally, some of those 18 were out of cases not vaccinated by Dr. Wright, was not that so?—Yes, that would appear to be so, but whatever the number of vaccinations no one can deny that out of the 18 cases of "erysipelas following vaccination" eight of them proved fatal.

15,326. (*Dr. Collins.*) Reverting once again to Table I., that apparently deals with all the 16 cases "vaccinated by Dr. Wright, probably with lymph taken on the 3rd October 1876," of those six died?—Yes, six of the 16 cases vaccinated by Dr. Wright were fatal.

15,327. (*Chairman.*) What is the next point to which you wish to direct the attention of the Commission?—At the conclusion of the last sitting of the Commission I was just finishing some allusions to a report by Dr. Barry on a case of death following vaccination in the northern district of the Derby Union, and I want to make one or two other references to that. (*See Appendix IV., page 484.*)

15,328. Will you kindly state to the Commission what is the point you make upon this report?—I wish to refer now to the condition of the instruments which were used by Mr. Legge, and the possibilities of contamination from the use of such instruments.

15,329. It would probably be enough if you refer us to the passage in his report, without reading it?—The passage is a short paragraph on page 5, towards the bottom of the page. Referring to the lancet and needle, Dr. Barry says they were sent to Mr. Farn of the National Vaccine Establishment for examination on the 23rd instant, and on the 24th November he reported as follows: "The lancet is found to be without a point, rusty and dirty." Then the last paragraph on the page is, "If the instruments were habitually in the condition described above, the possibilities of the inoculation of septic matter at both the periods of vaccination and of opening the vesicles, are endless." I wish now to make one reference to conclusion 5 arrived at by Dr. Barry on the last page, 6. He refers to erroneous entries which are made by the Public Vaccinator, and he says he has rendered himself liable to grave censure for this, and the question which arises in one's mind as to this and the point I wished to make was; were these erroneous entries made deliberately? What term would be used respecting some poor illiterate parent who might be guilty of such conduct? And why should we be less unsparing in our censure where the offender is a member of the medical profession and knew as no other man can know the full responsibility resting upon him as occupying that position?

15,330. (*Dr. Collins.*) Are you now able to answer the question I put to you on the last occasion whether any criminal action resulted from that information?—I have made inquiries as to whether any such proceedings have taken place. The only two cases which I can find anything respecting are those of Dr. Hubner, of Hollfield, in Franconia, who was sentenced in December 1853 to two years' imprisonment in a fortress for having communicated syphilis to eight children in and by the act of vaccination; a sentence reduced to six weeks on appeal to another court. The matter is fully narrated in Dr. Fournier's "Leçons sur la Syphilis Vaccinale," page 37. The other case is that of Dr. Dunlop, of St. Pancras Workhouse, who was proceeded against on a charge of manslaughter arising out of the death, after vaccination, of Lilian Ada Williams, born in the St. Pancras Workhouse on December 10th, 1882; vaccinated by Dr. Dunlop, without the mother's consent being asked or given, on December 15th; taken ill on the 28th; died January 7th; inquest; Verdict "That the child died from the mortal effects of suppurative meningitis, supervening on ulceration of vaccine vesicles of the arm." Dr. Dunlop was prosecuted on February 14th, 1883, but acquitted. I should like to refer in connexion with that to the statement of Sir John Simon in the Report of the Committee which sat in 1871. At page 384 Sir John Simon said "I believe it to be utterly impossible, except under circumstances of gross and punishable misconduct, for any other infection than that of cow-pox to be communicated in what pretends to be the performance of vaccination." Then I should like to refer the Commission to the 866 deaths which have been registered as following from erysipelas after vaccination or from cow-pox and other effects of vaccination, showing that notwithstanding the large number of deaths which have taken place resulting from operations performed by

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medical men and called "vaccination," really only one criminal action has been taken against any medical man, and even that proved to be abortive.

15,331. My question to you was whether any criminal action resulted from the information contained in the report by Dr. Barry on a death alleged to have been caused by vaccination in the northern district of the Derby Union?—None at all.

15,332. Do I understand that you have now given me the only two cases in which such criminal action has resulted?—Yes, the only two known cases.

15,333. One in this country and one in Germany?—Yes, these are all.

15,334. (*Sir William Savory.*) The one in this country being acquitted?—Yes, and the sentence in the other case being modified on appeal.

15,335. (*Sir James Paget.*) Do you know whether Mr. Legge still remains the Public Vaccinator in the district?—I do not know.

15,336. You do not know whether he was dismissed?—I cannot give that information.

15,337. (*Chairman.*) What is the next point to which you wish to direct the attention of the Commission?—I wish now to make one or two references to a report which has been already referred to before the Commission, in reference to the official investigation of a case of death from vaccination at New Humberstone. (*See Appendix IV., page 489.*) The contrast I wish to draw between this and the others that I have referred to is this, that in this instance we have a medical man who held a vaccination certificate. That is referred to on page 3. Dr. Ballard investigated this case, and he says, "I saw his certificate of instruction in vaccination; it was dated June 28, 1883, and signed by Mr. Pearse, who was then officiating for Dr. Cory at Surrey Chapel." You may take it from that, whatever may have been the qualifications of the medical men in the previous reports I have alluded to, in this instance we have a medical man who was thoroughly proficient in the practice of vaccination, and one who states that the lymph he used was purchased from Messrs. John Richardson and Company, of Leicester (you will find that on page 1), who are agents for "The Association for the Supply of 'Pure Vaccine Lymph,' the office of which is at 12, Pall Mall East, London. He also stated "that he purchased the lymph in two tubes, one-third full, immediately before using it; so he had not kept it by him for any time"—any length of time I suppose that means. We have here the case of a Public Vaccinator who was thoroughly qualified and who purchased what he considered to be pure lymph, and what was sold as pure lymph, and the establishment he purchased it from, Messrs. John Richardson and Company, of Leicester, is well known and it stands very high in repute, so that all the circumstances attending this case were such as should have conduced to thoroughly successful vaccination. This lymph was used later on to produce a supply for the periodical vaccinations, and I should like to refer to some remarks which are made by Dr. Ballard as to the effect of the lymph used. In the second paragraph on page 2—

15,338. (*Chairman.*) Cannot you tell us generally what is the point without reading the passage. If you will tell us what your point is, and then refer to the passage, we shall get through more quickly?—The point is, that although Dr. Nuttall, the operator, held a certificate of proficiency in vaccination, he did not understand very much about the operation, as is proved here by his admissions to Dr. Ballard of what he considered to be the extent of areola around the vaccine marks. Dr. Ballard says—

15,339. That is enough, that is your point, the passages you refer to are on what page?—The passages are on page 2 and page 3. Dr. Ballard says he notices that Dr. Nuttall has broken the Board's instruction which prohibits the use of lymph from areolated vesicles. Then Dr. Ballard in this report appears to throw some discredit upon the authorities for the insanitary state of the district. I took occasion to visit the clerk to the Guardians and asked for information as to this, and I understand that the Local Government Board have repeatedly refused to grant them urban powers to carry out certain sanitary improvements in the district. In this case Dr. Nuttall tendered his resignation immediately after the death of the child. In sending in his letter of resignation he says at the commencement that in consequence of the anxiety

attending public vaccination he wishes to tender his resignation, and he asks the Board to allow it to take effect from that day. That resignation was tendered before Dr. Ballard carried out his inquiry, but the Billesdon Board of Guardians expressed themselves as thoroughly satisfied with the way in which Dr. Nuttall had carried out his duties. What I wish to point out to the Commission is the difference between Dr. Guy, of Norwich, who is still the Public Vaccinator, notwithstanding the large number of disasters which occurred in his practice, and Dr. Nuttall, who is I believe, a very conscientious man and is profoundly sorry for what followed the operation, at once tendering his resignation—he seems to be tired of the whole business.

15,340. We need hardly go into that, it is a long way from the subject of our inquiry?—We have here in all 14 cases of deaths which I have brought to the notice of the Commission and which have been brought home to vaccination by official investigation. Out of the 14 cases which have been brought home to vaccination by official investigation there is only mention made of vaccination on one certificate. I do not know whether it would be considered to be fair or not (at any rate I think there is a strong presumption in this direction) that we might multiply the 866 cases which are registered by the Registrar-General by the 14, and that would give us presumably 12,124 deaths as likely to result from this practice during the years in which the 866 deaths occurred. Later on when I submit my statistics relating to Leicester this will be seen to be far more probable than it appears upon the surface at this moment.

15,341. Does it seem to you that it would be a reasonable course to multiply the number which have been returned by 14, because out of the 14 cases which have attracted attention and led to inquiry, only one was found to be referred to vaccination in the certificate?—Knowing what I do know of the large number of cases of injury and death which are alleged against vaccination but are never heard of publicly, I do not think it would be unreasonable.

15,342. That is another thing. I am not asking your inferences from other circumstances, but do you think that, because in 14 cases which have attracted sufficient attention to lead to investigation or in which there has been investigation it was proved that vaccination was only mentioned on one of the certificates, it would be reasonable to conclude from that that therefore there have been this number of deaths without vaccination being mentioned in the certificate, although attributable to it?—I do not mean to say it is actually so in fact, but I think the possibility exists.

15,343. (*Mr. Picton.*) Your point is that in 13 cases out of 14 deaths from vaccination, the cause of death was not returned as "vaccination"?—That is the point, and a most important point too.

15,344. (*Dr. Collins.*) I think you have shown us that in most if not all of these investigations the origin of the investigation arose from outside local information rather than from any intimation from the central office?—It did in all of them according to the evidence. I was just about to refer to a matter which occurred in connexion with two other deaths which are attributed to vaccination. In fact, one of the certificates states that the cause of death was "Vaccination, erysipelatos inflammation, acute bronchitis, exhaustion." These are the two cases which were alluded to by Mr. Hackett when he was here, and I have here one certificate of death that he referred to. Immediately afterwards the death of another child took place, named Collins. These are two cases which occurred at Hinckley, near Leicester. I saw the parents with respect to these cases, and when Mr. Collins, the father of the child, went for a certificate of death, the person who answered the door told him that Dr. Pritchard, the operator, was out. He came away, and knowing that unless he could obtain a certificate that day it would delay the funeral until a very awkward time for him, he returned again in a few minutes and found Dr. Pritchard at his desk. He asked for the certificate, and it was made out giving the cause of death as "marasmus, exhaustion." As he believed the cause of death was vaccination he spoke to the Primitive Methodist minister, who he told me went back and complained to Dr. Pritchard. Dr. Pritchard then added the words "erysipelatos inflammation" but would not put "vaccination" on the certificate.

15,345. (*Chairman.*) Do you think that it can be assumed as certain that in all cases in which vaccination



s mentioned in the certificate the death was caused by vaccination. Where disease sets in shortly after vaccination are there not cases (I think we have had such evidence before us) where vaccination has been mentioned in the certificate, although in the view of the medical man vaccination was not the cause of death?—I am not aware of cases of that kind, excepting those referred to by Dr. Ogle in the First Report, Questions 587, 8, and 9.

15,346. I am tolerably sure that vaccination is mentioned as having preceded erysipelas for instance, although in the view of the medical man the vaccination had not necessarily been the cause of erysipelas?—I can scarcely understand what is intended to be conveyed by that, it seems difficult to understand a case in which the opinion of the medical man is that vaccination has had nothing to do with the death and yet he mentions it upon the certificate. Such certificates may have been given, and afterwards subjected to official revision similar to those alluded to by Dr. Ogle in his answers to the questions I have just referred to.

15,347. (*Sir Guyer Hunter.*) I should like to ask you with regard to the reply you just now made to the Chairman, you said you could not conceive how it should be dissociated from the vaccination. I would ask you this question upon your reply to that. A child is vaccinated where the sanitary surroundings are exceedingly bad—of a gross nature. A person cuts his finger slightly where the sanitary conditions are grossly bad. The child who has been vaccinated gets erysipelas, the person who has merely cut his finger gets erysipelas. Do you believe that the erysipelas was the result of the lymph, of a something introduced into the system, or the result of the wound?—It is the result of the operation, but that does not touch the question raised by his Lordship.

15,348. I would ask for a categorical reply to my question. Do you believe that it was the result of the wound or the result of a certain something introduced into the child's system?—Possibly both.

15,349. How in the case of the individual who has only had a wound and got erysipelas?—In that case the wound would be accidental, not compulsory by law.

15,350. Purely accidental?—I mean the wound to the finger would be accidental, he would not cut his finger on purpose I presume.

15,351. Still the wound in each case causes an abrasion of the surface. You say you think that the one would be accidental and the other not so, why?—No, I do not say the erysipelas would be accidental, I say the wound itself would in one case be an accidental one; in the other case it would be the result of an operation compulsorily performed by law.

15,352. You do not see the point. Here is a wound inflicted by abrasion of the surface in two persons, in one there is superadded the introduction of a something into the system, yet both get erysipelas. Do you believe that where the lymph is introduced into the system, the material which is introduced into the wound is the cause or not, and if so, what is the cause in the other case?—I do not purport to be a pathologist, all I know is that in the first case it is erysipelas which follows upon an operation which is compulsory by law.

15,353. It is not a question of compulsion, we are dealing with an absolute case. There are two cases with the same result, and I ask whether it is the result simply of the wound or injury to the surface, or whether it is the result plus that of something introduced into the system, which do you believe it to be?—To my mind it does not matter whether it is one or both. It appears to me to be equally condemnatory of vaccination whichever way it may be. The abrasion of the skin is dangerous, and the introduction of a foreign substance increases the danger.

15,354. (*Dr. Collins.*) In connexion with the question which Sir Guyer Hunter has put to you, might I ask whether this passage from the appendix to the German official Vaccination Commission expresses your view? It is to be found at page 143 of our Third Report: "It is true that in many cases erysipelas may not be absolutely ascribed to vaccination, notably in the case of separate illness or the so-called vaccinal erysipelas. However, a number of cases of general illness taking place *en masse* have been registered, which happened immediately after vaccination, and in accordance with the latest experience derived from the etiology of erysipelas, admit of no other explanation beyond their having been caused by vaccination direct?"—That

would express my belief upon the matter before us. Then I have here, as touching upon this question of certificates, a letter written by a parent from Kyrle House, Peterston, Ross.

15,355. (*Chairman.*) Where is that taken from?—From the "Vaccination Inquirer," August 1st, 1887, page 93. The letter contains this passage: "The doctor, in his certificate of death, avoided all mention of vaccination, but, on my insisting that he should state the truth, he altered the certificate to 'Erysipelas from vaccination.'" The father goes on to say "It could not bring back our own dear child, but it may save other helpless little ones from so terrible a fate."

15,356. Is the name given?—Yes, Mr. J. Morgan.

15,357. Does it give the date of the death of the child?—No, that is not stated.

15,358. Is it stated to have been a recent case?—The letter is dated June 23rd, 1887, and it begins thus: "We have just buried our dear murdered one."

15,359. Does it give the Christian name of the child?—It does not state the name of the child. Perhaps I might be allowed to read this letter, as it describes the case of a child which is believed to have died from vaccination, and is a description given by the parent. I have a very large number of these cases and I wish to read one as a sample. Then I propose to read the description of the death of a child following vaccination which is given by a medical man.

15,360. (*Professor Michael Foster.*) The same one?—No, not the same one.

15,361. (*Chairman.*) For what purpose?—My purpose is to illustrate the difference between the description given of such a case by a parent, and the description given by a medical man.

15,362. (*Professor Michael Foster.*) They are two different cases?—Yes, but they are both deaths from vaccination.

15,363. Then how can you compare them?—It is two different ways of describing the symptoms that I wish to compare.

15,364. (*Chairman.*) You referred in the passage you read to a case of erysipelas?—Yes.

15,365. Two cases of erysipelas would be likely to be alike whatever the cause was?—Yes; but the other, which I wished to read, is a case of pyæmia, and not erysipelas.

15,366. I do not see the necessity for reading the account of the death. We have the document before us and we can refer to it; if you will give us the reference to the pages of the "Vaccination Inquirer" we can refer to it ourselves. Anything within your personal knowledge or any inferences you are able to draw we shall be happy to listen to, but I cannot see by your reading a number of instances that we shall gain anything. Have you inquired into the circumstances of this particular case?—No, not into the circumstances of this case, but I am satisfied with the testimony of the parent after reading his letter from which it appears that the medical man eventually entered vaccination on the certificate as the cause of death.

15,367. You said you wished to contrast this by the description of a death by a medical man. You can refer the Commission to the description by a medical man with which you wish to contrast the description by the parent?—I will deal with that later on if you will permit me to do so.

15,368. (*Sir William Savory.*) Before leaving that subject that you have just referred to I should like to ask you this with reference to the 14 cases of death that you spoke of, did not you say that there were 14 cases officially proved of deaths attributable to vaccination?—Yes; in these reports.

15,369. You include the Misterton cases in those 14?—I include the Misterton cases in those 14.

15,370. You assume that in all those cases vaccination has been proved to be the cause of death?—In reading the reports through I came to that conclusion.

15,371. But from this report with reference to the Misterton cases, do you come to the conclusion that in each of those cases it was established that vaccination was the cause of death?—Mr. Netten Radcliffe attempts to establish other probable causes, but he fails to do so.

15,372. Do you come to the conclusion yourself that in those cases vaccination has been proved to be the

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cause of death in each?—I do; I think it is by far the most probable of the causes certified in the report.

15,373. Then let me call your attention once more to that report in dealing with Whitehead's case. You have read that case—it is described on page 12 of the report. On the 46th day after vaccination erysipelas appears, and on the 64th day death occurs. That is one of the cases in which you consider it established according to official investigation that death was caused by vaccination?—I simply take it from the report.

15,374. The report does not say that it is caused by vaccination. When you quote to us 14 cases of officially proved death from vaccination, you want something more than such a statement as this. The report does not say that this is a case of death from vaccination, does it?—I am well aware that there are two cases in this report where death subsequently occurred which are not specifically referred to in the tables, but are mentioned in the paragraph.

15,375. That is one of your 14 cases?—I do not call it one of "my" 14 cases, but it is one of the 14 cases I have found in these official reports.

15,376. As a case of death from vaccination. Where is there any proof in the report that the death was from vaccination?—The report states that the child Whitehead was vaccinated upon the 12th of October, and died on the 14th of December.

15,377. "Upwards of six weeks from the vaccination, and long after the wounds caused by vaccination were healed, a diffuse rash, suggesting to the mother scarlet-fever, appeared on the breast and body of the child. The next day, the rash then disappearing, the skin of the hand of the vaccinated arm became red." What connexion is there between vaccination and erysipelas here?—This is not the only case.

15,378. I am speaking of this case?—Please allow me to illustrate my point by reference to another case. This is not the only case in which the wounds have appeared to heal and no erysipelas has immediately followed, but where the child has subsequently been attacked by erysipelas.

15,379. That only shows that there are other cases similar to this in which vaccination is not proved to have been the cause of death?—Yes; but I am referring to children who died sooner after vaccination than the one to which you are referring.

15,380. (*Chairman.*) But this is case is one of the fourteen by which you seek to multiply the 866. If you use the argument that you are entitled to multiply the number of cases of "death after vaccination" upon the certificate by 14, because there are 14 cases in which death is proved to have resulted from vaccination, though there is no certificate to that effect, it becomes important to see whether there are really 14 or 12 or 10 or what the number is, because that would materially affect the result?—There are 12 deaths undoubtedly, and the inference that vaccination was the cause of death in the other two is justified in my opinion by the evidence produced.

15,381. (*Professor Michael Foster.*) Do I understand that in the opinion of the inspector they were due to vaccination?—In his opinion perhaps not in every instance.

15,381a. (*Professor Michael Foster.*) In any instance in this official report on alleged deaths from vaccination is it the judgment of the gentleman who drew the report that the death was due to vaccination? I understand, according to Sir William Savory, that that is not his opinion, but that your opinion is at variance with that of the gentleman who drew the report.

(*Sir William Savory.*) He says: "In some of these cases the connexion of the erysipelas with vaccination was, to say the least, very remote." And he follows that up by saying: "In Doughty's case there would seem to have been no appreciable connexion at all."

(*Witness.*) The connexion here may have been remote, but still there was a connexion.

15,382. (*Mr. Picton.*) In dealing with these cases of alleged death from vaccination had you not in your mind the point that the parents of these children and their neighbours are subject to a compulsory law?—Yes, that is the particular point we are on now, and it materially affects the whole question.

15,383. They are not inclined to wait for very accurate medical opinions before forming their own rough judgment upon the subject?—That is so. The parents pay more regard to their own painful experience than to medical opinions which may happen to differ from theirs not being based on that experience.

15,384. Their opinion is formed by what they see?—Yes, from their experience of their children's sufferings.

15,385. (*Chairman.*) But when the Commission is asked to form an opinion as to the number of deaths actually caused by vaccination by reason of the proportion of deaths in which vaccination is mentioned in the certificates to those in which vaccination is not mentioned, although causing death, it does become important, does it not, to see whether the death really resulted from vaccination, apart from what the impression of the parent was, before you can draw any such inference as you have invited the Commission to draw?—Yes, possibly so, but the evidence of the official report fully justifies my conclusion.

15,386. What is the next matter to which you wish to direct the attention of the Commission?—I think, although we are dealing with the administration of the law, perhaps it would be better for me to put in a table of injuries and deaths from vaccination, which I have prepared. We have been professedly dealing with the administration of the law, but for some time we have really been dealing with injuries and deaths following vaccination. I now hand in a table of injuries and deaths which are alleged by the parents to have followed vaccination. (*The table was handed in. See Appendix III., Table 4; page 417.*)

15,387. What is the source from which you have obtained these cases?—The sources from which we have obtained these cases are these. A number of letters have been addressed to me, sending the particulars of these cases of injury and death, and we have tabulated them.

15,388. Do you mean letters from the parents of the children?—Yes, from the parents of the children. I had a letter which I purposed reading but it is comparatively unimportant, being similar to others we have received alleging vaccination to be the cause of the sufferings of the children.

15,389. Did the letters come to your society at Leicester?—They had been forwarded to various members of the society, and also in addition a large number of people outside the society altogether have forwarded them to us.

15,390. From what district do those come—all over England?—No, these are all in Leicester or Leicestershire; some of them are people who did not reside in Leicester at the time the injury is supposed to have taken place, but who are residing there now.

15,391. (*Professor Michael Foster.*) It is confined to Leicestershire?—Yes, to Leicester and the county of Leicester.

15,392. During what period; going back how far; is there any limit?—There are 29 cases prior to 1869. I referred some weeks ago to a number of special cases attested before the magistrates, and of that number there were 17 sufficiently serious to induce the magistrates to dismiss the summonses.

15,393. (*Chairman.*) Does this table include the special cases you have brought before us?—Not all of them; the table does not include the number who have already given evidence here.

15,394. What are the cases scratched out?—Those are the names of the children of persons who have already been before the Commission and given evidence. At the time this list was prepared and printed I thought I should hand it in prior to the parents coming before the Commission.

15,395. (*Sir Guyer Hunter.*) With regard to case No. 203, do you put that as a death by vaccination? I see it is stated that two doctors attended it, and the death certificate is "small-pox"?—It is the case of a death from small-pox after vaccination. The vaccination did not prevent it dying from small-pox.

15,396. Are you of opinion that the primary cause of death was vaccination?—No, I do not allege that, but that it was no prevention of small-pox.

15,397. (*Mr. Meadows White.*) I thought you put these in as evidences of injury, not of death?—A few of these are cases of death from small-pox after



vaccination, and the others are cases of injury and death following vaccination.

15,398. (*Chairman.*) In Case No. 203, the only thing to be noted is that the arm was much swollen, but you do not connect the small-pox with the vaccination, do you?

(*Witness.*) I have fuller particulars here of this case, from which it appears that the child became "very delicate" after vaccination, and therefore it was more susceptible to the contagion of small-pox, from which it eventually died.

(*Professor Michael Foster.*) The table goes back, I see, as far as 1866.

15,399. (*Mr. Meadows White.*) There is no description or heading to this paper; what description do you give to it?—It should be "Table of injuries and deaths following vaccination and of small-pox following vaccination."

15,400. (*Sir James Paget.*) When you say "following vaccination," have you any evidence that the children did not catch the small-pox before they were vaccinated?—These cases are sent by the parents, and I put the table in to show how widespread the feeling is that injury and death may follow vaccination; but in regard to the particular question you put, that of course it would be impossible for me to answer.

15,401. You put it in as a table expressing the beliefs of the parents, not expressing the real facts?—I believe it expresses the real facts, for this reason. When these names have been sent on to me, or have come to me, in every instance, I think, without exception, I have made personal inquiry, or someone responsible has been sent to make inquiry, of the parents as to whether the facts referred to in their letters were true or not. Where they have appeared to be doubtful they have not been entered there at all. We have struck out, I think, about a hundred in all upon that ground.

15,402. (*Dr. Bristowe.*) I wish to call your attention to Case No. 56, Samuel Tollington Clarke. It is said "Cancer formed at the back of the eye, which had to be taken out." Do you suppose that had anything to do with vaccination?—I cannot say whether it had or had not, but in the following column you find—

15,403. I asked as to this case?—Yes, quite so; and I was answering on this case. In the following column you find that the child was taken ill a week after vaccination.

15,403a. (*Professor Michael Foster.*) You put this in as a case in which the parents thought it was due to vaccination?—They thought it was due to vaccination, but we simply give the remarks which they make in their letters. All these are cases in which the parents attributed the death or injury to vaccination.

15,404. (*Chairman.*) But a portion of the table is headed "Effects produced," that must mean effects produced by vaccination?—I am not sure that that particular case referred to by Professor Foster is a death, it does not state that it is a death. I think that wherever death ensued you will find it so stated.

15,405. (*Sir Guyer Hunter.*) In running my eye over these cases my attention was struck by Case 229. The case of "Woodhead, W." "Cicatrices healed. Arm then became red raw, the erysipelas going down to fingers." Have you any evidence to show that erysipelas was the result of vaccination, because it goes on to state that, "Mother cried over it, and threatened to shoot the doctor if the child died." Have you any evidence to show that the erysipelas was in any way connected, either directly or indirectly, with the vaccination considering the cicatrices had healed?—I do not profess to produce any evidence in regard to any one of these cases beyond that which I have already stated. I put the list in for the purpose I mentioned at first, namely, to show the widespread belief among parents as to the possibility of injury or death following vaccination.\*

15,406. (*Sir William Savory.*) You also said, in answer to Sir James Paget, you believed it to be the fact?—Yes, and I gave as my reason that in every case we had sent to make inquiries, and where the inquiries agreed with the possibility of its being a genuine case we entered it. Where it was otherwise we struck it out.

15,407. Take case No. 60. Under the head "Effects produced" it says, "The child became very quiet. A doctor was called in, but child died day after." Apparently that means the day after vaccination, but it may be the day after the doctor was called in. I do not know which?—It would mean the day after the doctor was called in.

15,408. But it does not suggest what was the matter with it, or how long it was ill, or how long this was after vaccination?—It was 11 days after vaccination.

15,409. (*Mr. Meadows White.*) I see that on this table there is no reference to the purport or object of the paper. It ought to have a heading; you tell me it is a table of injuries and death, and cases of small-pox following vaccination. Do you mean by the word "following" simply supervening and death happening after vaccination in order of time, or do you mean the Commission to infer that vaccination was the cause of the death which followed?—The latter is undoubtedly the meaning and belief of the parents, and speaking generally it is also my own meaning.

15,410. The paper is not headed "This is what the parents said," and I wanted to know whether you meant by the word "following," death following in point of time shortly after, or do you mean by the word "following" caused by vaccination?—Caused by. If you look at the two end columns you will find that "Testimony of parents" is printed at the top of them.

15,411. (*Mr. Picton.*) It is the two end columns which are supposed to give the significance to these cases?—That is so.

15,412. (*Sir Charles Dalrymple.*) In regard to the significance of the case you mentioned just now, No. 60, will you look at the remark "One of the other children was ill nine weeks after vaccination. See below." What does that refer to?—To the next case; to the name just following, which is that of a brother to the child No. 60.

15,413. Then let us see what is said about that. "The eruptions recur. (Brother to the above, which died from vaccination)." Where is the evidence that the death was from vaccination? Let us take that as an instance?—If you look at the previous case, No. 60, you will find there "the child," that is the one referred to by his Lordship, "became very quiet. A doctor was called in, but child died day after."

15,414. (*Chairman.*) Might it not really as it stands quite as much suggest that the child died because the doctor was called in as because the child was vaccinated?—The words are very much abbreviated, but no one would be likely to attach the meaning your Lordship suggests.

15,415. (*Sir Charles Dalrymple.*) But I cannot make out who died from vaccination, that is what I meant by my question?—The note to No. 60, "See below," is intended to refer to the one immediately following. Then the words "Brother to the above, which died from vaccination," mean the one immediately preceding.

15,416. That is the one his Lordship was asking about?—Yes.

15,417. (*Chairman.*) Now take No. 136, vaccinated in 1877, effects produced, "Always crying after being vaccinated." Remarks, "Now dead." Do you know what date "Now dead" refers to?—That means at the time the information was sent; that would probably be last year.

15,418. But you have no information when the child died, because last year would be 13 years after vaccination?—The date of the death is not given in the letter. This is not given as a case of death but as a case of injury and suffering.

15,419. (*Sir James Paget.*) With reference to No. 131, it is stated "Arm seemed to get well, but 2½ years after it suddenly began to swell where vaccinated. Taken to the infirmary the child died two days after. On opening the arm the bone was found to have rotted away and poisoned the blood." Is it assumed that 2½ years after the vaccination, the vaccination could have produced that effect?—That is the statement of the parent, but the explanation of that, so far as I was able to gather, was this: that although the arm appeared to get well the infection that was conveyed remained and caused that result.

15,420. For 2½ years?—That is the statement of the parent as to the result 2½ years after the operation.

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\* But the connexion is sufficiently obvious in the fact that erysipelas immediately followed in the vaccinated arm.—J. T. B.



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15,421. Surely it would be well if all these were stated to be the statements of parents, and not given in by yourself as evidence?—I stated distinctly at the first onset that I put in the list to show the widespread belief of parents in injuries and death from vaccination.

15,422. All that refers to the parents is in these two columns, all the rest is assumed to be strictly evidence?—I do not know that any further distinction than that shown on the list is necessary.

15,423. (Mr. Meadows White.) I understand you to say you put this in as a table of injuries and deaths and cases of small-pox following from vaccination. I do not suppose you mean that the small-pox was caused by vaccination, but that such injuries and deaths were caused by vaccination?—The injuries and deaths are ascribed to vaccination by the parents, and the deaths from small-pox after vaccination show its uselessness as a protection.

15,424. That heading, when put in by yourself, implies that in your judgment all these cases of injury or death follow, or are caused by, vaccination; you do not mean to say that they have, do you?—I mean to say that that is the belief of the parents, and while they honestly believe it they are bound to resist the law, and I feel bound to help them.

15,425. (Sir James Paget.) The testimony of the parents also includes the "previous health" of the child, which is not put in the two end columns, and also the "source of the lymph"?—The whole is really the testimony of the parents, but the first columns, being matters of name, date, and source of lymph, seemed to be unimportant compared with the injuries produced.

15,426. (Sir William Savory.) Would you not say that the general result of this was to show that the statements of the parents could not be depended upon?—I would not like to say that.

15,427. (Sir Guyer Hunter.) In consequence of that answer I will ask you this: at No. 231 under "Effects produced" the statement is, "Had a horrible job 'with her,' and several doctors, but she died a skeleton." Then it is stated in the remarks, "The smell 'so dreadful it made another child ill, which died.'" Do you mean to say that the other child died from the smell, or what?—It was made ill from the foul smell and then died from the illness. We simply give the observations of the parents.

15,428. But you base your opinion on them. You put this in as a statement with regard to injuries and deaths caused by vaccination simply on the information afforded by the parents, is that so or not?—Parents who in many cases are illiterate, but not less reliable on this account.

15,429. You base your opinion upon the information afforded by the parents?—I have never stated that I base my opinion upon the information afforded by the parents alone.

15,430. Then what inference do you ask the Commission to draw from this paper?—The inference I wish the Commission to draw is that this proves that there is a widespread belief in the minds of parents that injuries and death can follow vaccination.

15,431. (Mr. Picton.) From the point of view of the enforcement of the law, would such cases as these which are reported to have followed vaccination render that extremely difficult in Leicester?—There is no doubt of that, many parents have declared that they would prefer to go to prison before having another child vaccinated, and they have carried their declaration into effect by going to prison.

15,432. (Sir William Savory.) Will you allow me to say that you have not been quite consistent about this? You tell us at one time it is to show what the parents think, at another time you say you believe the statements?—I do not think I have ever made that statement, but even if I had I do not see that there is necessarily any inconsistency.

15,433. You do not say that? Then it is merely to show what the parents believe?—I say it is to show what the parents believe; and I believe I may say in every case we have sent some one responsible to inquire as to whether the communication addressed to me could be verified by the facts, and whether the parents appeared to be reliable persons.

15,434. (Chairman.) That is to say you have not investigated the statements made; but that you have

investigated, as far as possible, the good faith of the people who made them?—Yes.

15,435. (Dr. Bristowe.) May I ask have the parents in all cases sent in these accounts?—They have not come direct from the parents in all cases.

15,436. Who have sent them to you?—Friends of mine in Leicester.

15,437. That you employed to hunt these cases up?—No; not so, or we should probably have brought a thousand cases instead of a few hundreds.

15,438. They do not come straight from the parents, do they?—Many of them do, but not all.

15,439. But they have been sought out by persons employed?—I do not know that they have been sought out particularly. We have had enough without seeking for them especially. What has occurred has been this: that when messengers have been sent to inquire as to the *bona fides* of parents, they have made inquiries at the same time (I have instructed them to do so) as to whether the parent is known, and any other circumstances or cases in the immediate neighbourhood.

15,440. Then you have sought them out?—Yes, where information has been given. But we ought rather to be commended for doing our best to test the information supplied us.

15,441. (Sir William Savory.) Those are all Leicester cases?—Yes, Leicester and county.

15,442. (Mr. Bright.) This is the parents' case, for whatever it is worth?—Yes, and an impressive case it is, in my opinion.

15,443. Not that you endorse it all, but it is what the parents state?—I do not profess to endorse every word.

15,444. (Professor Michael Foster.) Do you think there is any necessity for any evidence that very humble parents are extremely ready to attribute ill to vaccination?—There is no need for it in Leicester, because many such cases have been actually known to exist.

15,445. (Sir Guyer Hunter.) Do you place much value on that evidence?—The value I attach to it is this, that where you have a widespread belief of this kind it is utterly impossible to enforce vaccination.

15,446. (Professor Michael Foster.) The point is, is there any need of any evidence of this kind, everybody knows it?—But if any evidence I wish to put in is met with the observation that everyone knows it, there seems to be no necessity to put in any evidence at all.

15,447. (Chairman.) Only one would suppose we have already very strong evidence of that in Leicester, where this evidence came from, in the fact that vaccination has already practically ceased to be compulsory, owing to the strong opposition to it?—That is so.

15,448. (Professor Michael Foster.) You simply say parents do attribute evil to vaccination; that does not show to what per-centage generally?—If I have been able to produce a specific list like this it shows that the feeling is very widespread.

15,449. (Chairman.) This of itself would hardly show that the feeling is very widespread if it refers to the cases of something under 280 parents in such a county as Leicestershire spread over 30 years. I do not mean to say the feeling is not widespread, but that table would hardly show it?—The injuries and deaths altogether that I have alluded to in this and previous lists make a total of 369; 146 deaths and 223 injuries attributed to vaccination, after deducting something like 100 for probable duplicates and for those which would not bear what we consider to be strict investigation. Of course if the Commission wish, I believe I can bring many of these people here, and it is open to the Commission to make any inquiry they think proper in regard to them. In regard to an observation that has been made, that with a very large number like this we must probably exhaust the town; I can say this is by no means the case, because since this list has been printed I have had letters addressed to me. I brought one with me this morning, from a parent of whom I know nothing whatever. It was simply known that I was giving evidence before this Commission, and for that reason it was sent. I had proposed reading the letter. The parent of the child asked me whether he could come and give evidence before the Commission. I told him that I did not think it would be necessary, but that I would lay his letter before the Commission.



15,450. (*Dr. Collins.*) Did I understand you to say that these cases have not been hunted up by persons employed, but that the initiative in each case with respect to the information, has come from the parents or guardians?—In a large number of cases the initiative did come from the parents themselves, in others the information came from various sources.

15,451. Do you think in the majority?—I really could not tell you what proportion; but when information has been brought, and a messenger has been sent to inquire, in that case they have always asked whether there have been other cases in the neighbourhood. It was thought at one time that we would canvas the whole town, but as a matter of fact this was not done, although in these particular instances to which a messenger was sent, so far as one might call that a canvas, a canvas was carried on.

15,452. (*Professor Michael Foster.*) Do you put this in simply as an illustration that there is a great deal of feeling on the part of parents on the question of vaccination, or do you put it in as a list of cases which if we please we may investigate?—I put it in under both heads.

15,453. The two are absolutely different; in the second case it should not be published in its present form; it should only be in our possession in order that we may investigate it?—I have tabulated here some of the results, and I might just refer to them briefly. In the first place, there are 17 to 20 of these names which are those of people whom I know personally. Secondly there are a number of cases where the parents stated that they would go to prison rather than have another child vaccinated after observing what they believed to be the effects of vaccination in their families. There are a number of cases where diarrhoea is alleged to have followed vaccination, and abscesses and fits, and in seven or eight cases the children died of small-pox following vaccination; and there are four cases which appear to be probable cases of syphilitic inoculation.

15,454. (*Mr. Hutchinson.*) Which cases do you refer to as such?—Nos. 177 and 192.

15,455. What is your reason for suggesting that No. 177 is syphilitic?—From the statement of the parent which is contained in the column "Source of Lymph."

15,456. Because the parent says the source of the lymph was "from a child whose father was found to have a bad disorder." Do you think that statement is sufficient to justify the conclusion without anything specific in the diagnosis?—I said "probable cases." I did not say they were actually verified cases.

15,457. (*Sir William Savory.*) Do you think that makes its probable?—I think that makes it probable.

15,458. You do not know what was the source of the information about the child's father?—Only from the testimony of the parent.

15,459. (*Sir James Paget.*) And you would accept testimony of that sort if any given person said somebody else had had the bad disorder?—No. In this particular case I sent a messenger to inquire, and from inquiry made (I believe this was the testimony of the parent, but I am speaking simply from memory) the parent after making complaint to the medical man ascertained that this was the fact.

15,460. You accept it as evidence that any person has venereal disease because some woman told him so?—Decidedly, if the woman obtained her information from some other source which she regarded as reliable; I believe from the medical man himself.

15,461. Do you really believe her?—I know of no reason to doubt her statement. I am speaking from memory; it is exceedingly difficult to remember full particulars of all these cases, or even any part of them.

15,462. But in this paper they are put down as facts?—They are put down as statements of the parents.

15,463. They are put down as if they had been clearly ascertained matters of fact?—To the best of my belief they are.

15,464. (*Chairman.*) It would be necessary to show in this table the cases which proceed from the testimony of the parents as well as what appears in the two last columns, otherwise it would appear as though those were facts ascertained upon a different basis from the testimony of the parents in the two last columns?—So far as I can qualify them I certainly see no harm in putting that in. Whatever will make it clear I am willing to add.

15,465. (*Mr. Picton.*) In the particular case referred to you had the information that the doctor said it, how would you obtain that information?—I sent a messenger, and to the best of my recollection that was the reply he brought.

15,466. (*Chairman.*) Did the messenger bring you back a written statement?—I think he did.

15,467. Could you look that up?—I could. I will do so with reference to case No. 177.

15,468. (*Professor Michael Foster.*) I gather, with reference to case No. 1, that the expression "doctor" said it was 'through vaccination' means that the parents said that the doctor said that it was through vaccination?—Yes. I think that I can find the written statement.

15,468a. (*Chairman.*) It is "doctor" not "the doctor" who attended him?—It should have been "the" doctor.

15,469. (*Sir Charles Dalrymple.*) Do you not think if the fact had been that the bad disorder had been syphilis it would have been stated, because of its extreme gravity?

(*Witness.*) In the parents' testimony, do you mean? They might not be able to distinguish between the two.

(*Dr. Bristowe.*) I suppose a "bad disorder" means gonorrhoea as well as syphilis?

15,470. (*Chairman.*) What is the next case in which you say syphilis is suggested?—No. 192.

15,471. (*Mr. Hutchinson.*) In case No. 192, which you mention, there is no suggestion of its being syphilis so far as I can see, and not the slightest reason to think so?—I will refer to the observations which I have here. The statement here (I am not quite sure whether it is in print) is as follows: "After inflammation and swelling the arm broke out in sores, foul eruptions appeared in the nose and face; the nose seemed as if it would rot off; the child became blind, and died almost raging mad."

15,472. Is there any suggestion of syphilis there?—I think there is a suggestion of syphilis so far as I can judge from my knowledge by the nose appearing as if it would rot off.

15,473. Why did you put it in the syphilitic list?—I referred to it because the indications appeared to be in that direction.

15,474. It is your own opinion from your information that the nose appeared likely to rot off, is that the only reason for suggesting that it was syphilitic?—I cannot say it is the only reason without referring to my notes which are at home.

15,475. You have given the Commission Nos. 177 and 192; which are the other cases?—No. 196, for instance.

15,476. Now in No. 196, what is your evidence regarding syphilis when it is distinctly recorded as erysipelas?—If you will kindly refer to the column headed "Remarks" you will find that the observations which refer to this case are as follows: "The death was attributed to 'Devouring Wolf,' caused (so the doctor said) by vaccination, as the grandfather of the child from which the lymph was taken died of the same disease."

15,477. There is no suggestion of syphilis in the "source"?—Only this: I know it is the opinion of some that "Devouring Wolf" is caused by syphilis.

15,478. That is all?—That is all.

15,479. (*Sir James Paget.*) Do you regard "Devouring Wolf" (the expression you use) as a syphilitic disease?—I cannot answer that: I am not a pathologist.

15,480. But it is entered as syphilis in your list?—I have not entered it as such; I merely refer to it as a probable case of syphilis.

15,481. (*Mr. Hutchinson.*) You classified it as such?—I say it is one of the four cases to which I have alluded.

15,482. (*Dr. Collins.*) Do you undertake to make a medical diagnosis upon the information submitted to you?—I do not.

15,483. (*Sir James Paget.*) Then why enter that as syphilis?—I have not entered it as syphilis. I simply referred to it as a "probable case of syphilitic inoculation."

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- Mr. J. T. Biggs.* 22 Apr. 1891. 15,484. (*Mr. Meadows White.*) Then you have undertaken the diagnosis?—If you accept that as diagnosis, I have.
- 15,485. (*Sir James Paget.*) What renders it probable?—I have not seen the children themselves. The only thing which renders it probable is the evidence that is given by the parents; what more is wanted?
- 15,486. The evidence being that the child's grandfather died of "Devouring Wolf," is there any probability that "Devouring Wolf" there meant syphilis?—I cannot say whether it did or not.
- 15,487. But you rather imply that it did, because you say "probably syphilis"?—I did.
- 15,488. Is it probable?—I thought so from the evidence that had been given to me by the parent.
- 15,489. (*Chairman.*) Now, what is the fourth case?—No. 236. The parent of this child is living now, and he asked me whether he might come to give evidence. I dissuaded him from doing so, because he is very aged; he is an inmate of a hospital, and he is lame, but I have no doubt he would be willing to come and give you any evidence he possibly could.
- 15,489a. (*Mr. Hutchinson.*) Is there any medical evidence to be obtained?—
- (*Chairman.*) It is 33 years ago, unfortunately.
- (*Witness.*) I rather doubt whether there would be any medical evidence, but the parent is living. I know him perfectly well.
- 15,490. (*Mr. Hutchinson.*) You do not know what certificate of death was given in this case?—I do not.
- 15,491. (*Mr. Bright.*) No. 154 is a case which might be put possibly into your list. Under the heading "Source of Lymph," it is stated that the father of the child from whom the vaccine was taken had "a nasty complaint." Do you know what that means?—I do not know. We have simply in this list given the expression of the parents, we do not say they are pathological expressions.
- 15,492. (*Professor Michael Foster.*) Did you make any inquiry about No. 206?—I did not make a personal inquiry.
- 15,493. Do you know what meaning the parents attached to the phrase "a sort of foot-and-mouth disease"?—I cannot tell you that.
- 15,494. I observe that that is one of a very few of these cases which were vaccinated from the calf. Do you think that there was in the mind of the parent any connexion between the two things?—Yes, there was; they attributed the peculiarity of the child's suffering to that cause. I believe there are four cases referred to calf lymph.
- 15,495. Do you think it really worth while making that statement on the part of a parent "a sort of foot-and-mouth disease"?—It shows a tendency in the minds of parents to associate certain things with the practice of vaccination; they may be right or they may be wrong, but that does not affect their opposition to the law.
- 15,496. You think it is worth recording that parents should attribute "a sort of foot-and-mouth disease" to vaccination?—If they stated so, I should think it was; and I cannot say that I see much absurdity in it either.
- 15,497. (*Sir William Savory.*) You would take this as a very fair illustration of the value to be attached to the testimony of the parents?—It is a fair illustration of the amount of belief existing in the parents' minds.
- 15,498. I asked you whether you would accept that as a fair illustration of the value to be attached to the testimony of the parents?—It is the parents' belief. For myself, as I stated before, I should require to make further investigation; but the fact remains that the child did suffer in the mouth and feet, from which "oozed a dirty kind of matter."
- 15,499. (*Chairman.*) What is the next matter to which you wish to direct the attention of the Commission?—I have some other cases of injuries and deaths, one of them I saw myself, and perhaps I may be allowed to allude to it. I heard a rumour of this case in the town; it is the infant child of Joseph Millbourn, who resided at that time at 13, Alexandra Terrace. The child was vaccinated at the Rupert Street Vaccination Station, May 14th, 1884. A week afterwards lymph was taken from the vesicle with the result that erysipelas supervened, and after very great suffering the child, which was a very fine one before vaccination, died on the 5th June. I went to see this child, its head was very much swollen, the features distorted and considerably disfigured, and the back of the head and neck presented a discoloured appearance. The body was considerably swollen, and the legs were covered with ugly red patches varying in size. The feet had been much inflamed, and upon the top of each foot was a large red looking blotch. The inflammation from the vaccination wounds had extended to the arm, neck, and head, and from these to the whole body. Information respecting this case was conveyed to the Coroner, who said that as the medical attendant had visited the child three times he thought it was unnecessary to hold an inquest. The Public Vaccinator performed the operation, but the medical man, Dr. Grandison, who was called in by the parent himself, told me that he believed the child would have then been alive if it had not been vaccinated. Notwithstanding this, in his certificate of death he gave "erysipelas" as the primary cause, simply because the child was suffering from erysipelas when he first saw it; but he admitted to me in the presence of the father of the child that vaccination had been the cause of the erysipelas. I subsequently heard that the Coroner remarked "if the anti-vaccinators got to know, 'there would be such an outcry'; and I presume this was the reason no inquest was held."
- 15,500. Where did you hear the Coroner had remarked that?—I cannot tell you where I heard it, but I heard the observation made.
- 15,501. You would hardly rely upon that. When you say, "That is probably why no inquest was held," do you assume that necessarily the Coroner did say that because you heard it from somebody?—I feel sure he did. I addressed a letter on the subject to the press at the time, this was in 1884; and my account of this matter is now simply taken from the letter I wrote to the press.
- 15,502. Your inference is drawn from the fact, is it, that there was no reply to the letter?—No, it is not an inference; it was a definite statement made to me by some one (I believe the parent himself) who overheard the observation at the time. Then I have another case before me, which comes in under the administration of the law, which perhaps I might be allowed to allude to. Although it resulted in death, it is rather outside vaccination. It was caused through the administration of the law. I will explain the case as briefly as I can. Arthur Ward, of 95, Evington Street, had two children injured through vaccination, and refused to submit any others to the operation. A fine was imposed on him, and on the 24th November 1883, two policemen called for the money, or in default to ticket his goods. Mr. Ward happened to be at the market and his wife had no money to pay. The goods down-stairs were considered insufficient to cover the amount, and the officers demanded to go upstairs. I allude to this case to show how harshly the Acts have borne on parents under certain circumstances. The woman refused to allow them to go upstairs, and an altercation took place. Harsh language was used by the officers, who threatened to take her husband to prison. This very much terrified Mrs. Ward, and she borrowed the money and paid the fine. Being pregnant at the time, the fright and shock to her system were of such a character that certain symptoms ensued which ultimately led to her premature confinement, and on the 26th December she gave birth to a still-born child. She never rallied from the shock caused by the fright, the symptoms continuing during the whole period until she expired. The medical certificate stated that the primary cause of death was "anæmia," and the secondary cause "syncope"; so that death supervened from the symptoms referred to. When I heard of this case I visited the man to ascertain the full particulars, and I also visited the medical man, Dr. Greasley of Leicester, who is not by any means favourable to the anti-vaccinators. I asked him if he was prepared to make a statement respecting the case before the Board of Guardians, if requested, and he replied that he considered it was a public duty to do so. I mentioned the matter to the Board of Guardians, but they thought it was more to do with the Watch Committee, as the police were implicated. I wrote to the Chief Constable, and stated that I wished to attend before the Watch Committee, and bring these facts before them; and by appointment I attended, and Dr. Greasley also attended and made his statement, and he declared that the death of the woman was due



to the shock caused by the visit of the police. I endeavoured, in view of this, to persuade the authorities that in future instead of policemen, being sent in uniform in such cases, they should be sent in plain clothes, and that one officer only was sufficient, because, although a very large number of prosecutions have taken place, amounting to thousands, the people, as a rule, have been exceedingly peaceful, and have admitted the officers without making opposition. The matter was investigated by the Watch Committee who exonerated the police from blame; we brought no charge against the police, because we believed they were simply carrying out their ordinary duty. It was decided after investigation by the Watch Committee that the death arose from the cause alleged by the medical man, Dr. Greasley. I saw Dr. Greasley a few weeks ago, and he remembered the circumstances, and he said that he was fully prepared to declare this before any tribunal. He wrote a letter to the press justifying what he had said before, and this letter was published, in which he states: "The facts which led me to form this opinion are these, 1st. The deceased woman was in perfect health up to the time of the visit of the police; 2nd. She became extremely ill immediately after their visit, and said to a neighbour 'I don't know what has happened to me, but I feel extremely ill;' 3rd. She told me on my first visit, when asking her as to the cause of her hæmorrhage, that she had been much alarmed and perturbed by the visit of the police. The hæmorrhage was of the kind known to surgeons as 'accidental.' So the order of events was: Excessive fear, hæmorrhage, death." He goes on to ask in this letter: "Can any reasonable person, medical or lay, suppose that the two latter conditions were not the consequences of the former? The Watch Committee by their report have supposed that they were only coincident, but the coincidence is very much too remarkable."

15,503. Does that conclude what you have to say about cases of injury?—I have a large number more, but I do not know whether it is necessary to put them in. The feeling of the Commission appears to be rather averse to them.

15,504. A "large number" of what? Will you give us the description, and then we shall be able to judge?—I have a large number of cases here where juries have passed verdicts in regard to cases; and in one or two instances questions have been asked in the House of Commons respecting them.

15,505. If you would give the Commission the date of the inquest in which you say there has been a finding in reference to vaccination that would probably be enough?—This extract I now propose to read is taken from the "Universe," which was published, I believe, in October 1876. "The jury returned a verdict to the effect that the children died from the effects of 'pyæmia'; and the observation made by the 'Universe' is that 'the vaccination was skilfully performed, and the lymph was from a good source; but what were the precise causes leading to the blood-poisoning the evidence did not enable the jury to say.'"

15,506. What is the "Universe"?—It is a paper called the "Universe."

15,507. Is it a London or a country paper, and a daily or weekly, or what?—I cannot tell where it is published. I have only taken this extract; it was published in the "Vaccination Reporter" 1st volume, No. 3, pages 1 and 5.

15,508. (Mr. Meadows White.) Is that "Vaccination Reporter" adverse to or favourable to vaccination?—Adverse to vaccination. Then an inquest was held on the bodies of two children at Grimesthorpe. This was published in the "Sheffield Independent" of November the 20th, 1877: "These children were both vaccinated at the private dispensary, Attercliffe, by Mr. Turner, assistant to Dr. O'Meara. Evidence was only taken in the case of George Henry Taylor, son of Robert Taylor, hammer driver, Grimesthorpe. It was shown that he was a healthy child until vaccinated about a fortnight previously. The day after the operation the child's arm was much inflamed and there was a good deal of constitutional disturbance. He was then attended by Mr. Quin, Surgeon, Grimesthorpe, who thought he was suffering from vaccination, and 'feared it would turn to erysipelas.' He saw the child daily. The symptoms became more aggravated, erysipelas appeared, and Mr. Quin concluded 'that

"vaccination was the exciting cause of death.' Mr. G. H. Shaw, of Attercliffe, a well known and accomplished practitioner, made a post-mortem examination, and found the cause of death to be erysipelas and inflammation of the lungs. This disease he thought 'was brought on from infectious matter having been introduced into its system by 'vaccination.' Mr. Shaw further said, 'I have no doubt the vaccination was properly performed, but that the matter was bad is shown by the death of the child. . . . If improper lymph was used 'it would establish blood-poisoning, and there would 'be erysipelas, abscesses, and so forth.' What I wish to establish by referring to these cases is this: We notice again and again observations made that the vaccination was properly performed and the lymph was from an unimpeachable source, yet we find these disasters do occur, even after apparently the utmost care on the part of practitioners."

15,509. (Chairman.) But the medical man does not seem to suggest that it was perfectly pure lymph, does he? He said "the vaccination was properly performed, but," and so on?—He says "if improper lymph was used," but surely we must suppose the medical man believed the lymph to be pure.

15,510. Does he not suggest that improper lymph might have been used in this case?—That may be the suggestion; in this case it states that the operation was properly performed, but in other cases it is stated distinctly that proper lymph was used. In some of the cases to which I have referred, New Humberstone for example, it struck me that the operation was not only carefully performed, but that the lymph was of the purest character that could be obtained. Before I finish this part of my evidence I should like to allude to a case which I referred to before. This is an extract from the reports of St. Bartholomew's Hospital. The notes are by Mr. W. Bruce Clarke, M.B. They are clinical notes of some cases which occurred in the now Sir William Savory's ward. I allude to this case because it is a case (which can be testified to, I presume, if need be by a member of the Commission) of pyæmia after vaccination. This is published in the report of 1879, volume 15, page 162.

15,511. A report of what?—St. Bartholomew's Hospital reports. The case occurred in the Stanley ward. "Pyæmia after vaccination. Death. Catherine C., aged 14 weeks, 1879, August 26th, a small ill-nourished child. Admitted with the following history. Was vaccinated on the 11th instant. There are four well marked vaccine pustules on the left arm in the usual situation. Nothing unusual was noticed until after the eighth day. About the ninth day or perhaps later the child began to refuse its food. On searching, a tender lump in the left axilla was then noticed. It became gradually worse, and the right hand swelled up. On admission, fluctuating swelling in left axilla. On the dorsum of the right hand and lower part of forearm is a hard oedematous swelling occupying nearly the whole of the circumference of the arm but less in extent on the palmar surface. There is a similar swelling, only circumscribed and about the size of a walnut, on the anterior surface of right thigh, about the middle. Child seems dull and heavy, half stupid, with its eyes and mouth half closed. It can be roused, but soon relapses into its former condition. Has occasional fits of crying. Tongue furred. Bowels not open for two days. Pulse 160, variable; temperature 103°. Abscess in axilla freely opened. about 3ii." (two drachms, or, roughly, two teaspoons) of laudable pus evacuated. Ol. Ricini ʒss. statim" (half a teaspoonful of castor oil forthwith). "August 27th, bowels open, child much the same. Temperature 102° 6' morning, 103° 4' evening. August 28th, general condition rather worse, more dull and heavy. Swelling in right wrist has increased in size, as also has that on right thigh. A similar swelling has appeared on left wrist, and the left thigh is red, inflamed, brawny, and tender. Ordered brandy, mx." (10 minims or roughly 10 drops) "at frequent intervals. Temperature 99° 4' morning, 103° evening. August 29th, gradually sinking; temperature 101° 2' morning, 98° evening. August 30th, died early in the morning. Post-mortem: The inflamed spots on the limbs were found to contain a large amount of effusion but no pus. Spleen, liver, and kidney exhibited some cloudy swelling. Pleura, small effusions of blood occurred, giving it the appearance of a piece of skin from a patient suffering from purpura hæmorrhagica." I

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refer to that as the description of a child whose death followed vaccination; it is the one I alluded to at the commencement of the sitting. That description is given in medical language; but to my mind it does not convey any more than the descriptions which are given by the parents themselves.

15,512. (*Sir James Paget.*) Do you suggest that there is any comparison or parallel between the value of the statements made by parents and the statements like that of Mr. Bruce Clarke, made by an accomplished surgeon; that is to say, any comparison as to the probability of being accurate?—I should take this statement of the surgeon to be absolutely accurate.

15,513. You imply that the statements of parents are as readily to be accepted as that?—What I wished to show was this: that it is quite possible that in the list of injuries and deaths I have presented a large number of the cases, if described in medical language, would have been described in a manner similar to the description given here.

15,514. That implies that you think the statements of parents, if translated into medical language, would be as accurate as the statements by an accomplished medical practitioner?—In many of these cases they would be as accurate, although not couched in professional language.

15,515. You think that?—I do think that.

15,516. (*Mr. Picton.*) Your point is that in this case the medical authorities have confirmed in more accurate language the account that was roughly given by the parents?—That is exactly what I mean.

15,517. (*Chairman.*) Which is the case in your tabulated list of cases which you put in which you would say is the parents' description of what the doctor there describes?—I did not intend to read a letter relating to any of the cases I have put in, but the letter of a parent who was writing to the "Vaccination Inquirer," as it alluded to his interview with the medical man; but in compliance with your Lordship's intimation I did not read the letter.

15,518. That is to say when the parent describes the case, stating that it is erysipelas, his description of what he observed may fairly well correspond to the description which a medical man may give of erysipelas; is there anything remarkable in that?—Nothing remarkable that I am aware of.

15,519. You will see that in the letter that you wish to compare with the medical description, the parent states that it was erysipelas, there was no question of what the complaint was. The parent had then heard probably from the doctor that it was a case of erysipelas and then describes what he sees. I do not quite follow what your point is?—Both parent and doctor agree with regard to the case you have just recited.

15,520. The case that you have just read was a case of pyæmia. Are you suggesting that the parents' description of a case of erysipelas being similar to a description by a medical man of a case of pyæmia shows that the parents had accurately described a case of erysipelas, or that erysipelas is pyæmia, or what?—I know that if the parent had seen the case I have just read, in all probability it would have been expressed in similarly plain language to that used in the letter printed in "The Vaccination Inquirer." There would have been a great contrast between the phrases used by the parent and the phrases used by the medical man; but I do not see why one should impugn the statements of the parents simply because they are not expressed in medical phrases.

15,521. Has anybody suggested that his statement was to be impugned?—No, I do not desire to imply that any suggestion of the kind was made. Proceeding with my evidence I wish now to refer to a statement that was made by Mr. Ritchie in the House of Commons, which is taken by extract from *Hansard*, New Series, volume 330 column 509. In a speech Mr. Ritchie made in the House of Commons on November 6th, 1888, he said: "With regard to the cases alleged of the particular disease" (syphilis) "referred to by the honourable member for Northampton" (Mr. Bradlaugh) "he had always instituted inquiry immediately, and the result had been that there was not a single proof that the disease" (syphilis) "had resulted from vaccination." That statement was made in the House of Commons.

15,522. (*Mr. Meadows White.*) How long had Mr. Ritchie been in office?—About three years, I believe, but I take it that his observation alluded not only to the

period during the which he had been in office but to general practice.

15,523. I thought it referred only to cases which he had himself caused to be investigated?—Mr. Ritchie said "With regard to the cases alleged of the particular disease" (syphilis) "referred to by the honourable member for Northampton" (Mr. Bradlaugh) "he had always instituted inquiry immediately."

15,524. He had as President of the Local Government Board, "instituted inquiry immediately, and the result had been that there was not a single proof that the disease" (syphilis) "had resulted from vaccination?"—I think it is the general belief that the Local Government Board do institute such inquiries.

15,525. I think Mr. Ritchie appears in that extract only to be referring to cases in which he has ordered investigations?—I take it to have a broader meaning. I think the same answer has been made to similar questions before.

15,526. Have you any of the cases as to the inquiries made to which Mr. Ritchie refers?—No.

15,527. (*Chairman.*) You were about to proceed to the question of the introduction of syphilis by means of vaccination?—I was referring to the statement of Mr. Ritchie as a sample of the statements which are generally made in Parliament on the subject.

15,528. But if Mr. Ritchie limited his statement to his experience since he had been President of the Local Government Board, have you anything to show that that was inaccurate?—I have not. I do not wish to show that it is inaccurate at all.

15,529. I do not quite understand for what purpose you cite that?—This statement made by Mr. Ritchie seems to imply, as I take it, that wherever investigations have been made not a single proof that the disease syphilis has resulted from vaccination was found.

15,530. Do you mean in all time?—Within recent years.

15,531. (*Professor Michael Foster.*) What are the words which lead you to that opinion?—Mr. Ritchie says that he has "always instituted inquiry immediately, and the result had been that there was not a single proof that the disease had resulted from vaccination."

15,532. (*Chairman.*) Surely is not that statement confined to the inquiries he has instituted, and not a general statement referring to the possibility or otherwise of introducing a particular disease?—Those particular words do apparently so confine it; but I think it is generally understood that the Local Government Board institute such inquiries.

15,533. The Local Government Board institute such inquiries; but does he there say that wherever the Local Government Board have instituted such inquiries that has been the result?—No, he does not say that.

15,534. What does the Local Government Board instituting such inquiries have to do with it, I do not understand it?—I am sorry to have not the full extract from the report giving the whole debate, it would probably explain that; but if we may assume that that is still the practice of the Local Government Board, and taking that answer as representing the practice of the Local Government Board, I was going to refer to some cases which I think sufficiently prove that that disease can be conveyed. A committee of the Medico-Chirurgical Society appointed to examine Mr. Hutchinson's cases of vaccino-syphilis, thus report in the "Transactions" of the society for 1871, page 345: "In our opinion these three cases —

15,535. Those we have had before us already more than once, I think?—Not these particular cases, I think; these are cases investigated by a special committee.

15,536. Will you refer the Commission to where we may find that; we have had it already?—It was simply to place on your records the opinions of some medical gentlemen as to the possibility of conveying syphilis.

15,537. That is to be found in the volume of "Transactions" you have referred to?—Yes, at page 345.\*

15,538. (*Dr. Collins.*) Does the evidence there contained to your mind tend to oppose the statement that "the

\* The extract referred to reads "In our opinion these three cases present unequivocal evidence of constitutional syphilis, and we see no reason to doubt from the appearances presented by the arms, and from the history of the cases, that the disease had been conveyed by vaccination", and is signed "S. Wicks, W. S. Savory, Geo. G. Gascoyn, Thos. Smith."—J. T. B.



"alleged injury," namely, the transmission of syphilis by vaccination, is "indeed disproved by all medical experience," which is the statement contained in "Facts concerning Vaccination, for the Heads of Families," revised by the Local Government Board and issued with their sanction?—It contains indications, and indeed proves to my mind, that that statement is wrong; and I think I have proofs here that it is absolutely untrue. Turning to another subject, I should now like to make one or two further references to medical certificates. We have had some previous references to that matter. This is an extract from the "British Medical Journal" of the 15th of July 1882, being an article published there on hospital death certificates, the method of giving which is strongly censured by a Coroner's jury under the presidency of Mr. W. J. Payne. This inquest was held on the bodies of three newly born children who died shortly after birth; and the special feature in each case was that a student attended at the confinement, and, owing to the peculiarity of the death certificates given at the hospital, the local registrars refused to receive them. The "British Medical Journal" goes on to say, "With regard to the method of signing the certificates it was the common practice to sign them on the report of the students and without seeing the child at all. In reply to the Coroner and jury, the witness said they were quite aware that by the Act of Parliament they rendered themselves liable to a fine and two years' imprisonment by pursuing this course. Witness could see also that for the staff to sign certificates on mere information might sometimes lead to serious results." I give that in as an indication, or proof I may put it, that the method of signing certificates is sometimes an exceedingly careless one. "The Coroner said that the inquiry had revealed a blot on the hospital system, and he would take care to lay all the facts before the Registrar-General. The jury returned a verdict of death from natural causes in each case, and added a rider censuring the hospital authorities for not sending properly qualified persons to see the dead bodies before granting certificates for the registrars." Then on page 41 of the report of the Metropolitan Asylums Board for 1889, Dr. John McCombie, Medical Superintendent of the South Eastern Hospital, in his annual report to the above Board, states: "That out of 26 patients sent to the South-Eastern Hospital in the year 1889 certified by duly qualified medical men to be suffering from small-pox, only five of these were really small-pox cases, the remainder being 15 cases of chicken-pox three of measles, one of rheumatism, and two of chronic skin disease." I mention that to show that while parents sometimes may be wrong in the diagnosis of illnesses from which their children are suffering, the same thing applies sometimes, I do not know how far, to medical men. I have now put in, my Lord, the whole of the evidence I wish to offer in regard to the administration of the law; and I would just state, speaking for Leicester, that we have put before the Commission a large number of witnesses; the Mayor, the chief magistrate of the borough has appeared, and the Deputy Mayor, a number of magistrates and Aldermen and members of the Council, the chairman of the School Board, the ex-chairman of the Guardians, and a deputation from the Guardians and from all the public bodies; and I think that the evidence which has been tendered will show that the opposition to the law in Leicester is exceedingly strong. In regard to the Guardians especially—

15,539. (*Chairman.*) Would it not be well to leave the Commission to judge of that. We have had all these witnesses, and we have heard them, and we shall consider and judge of their evidence; it is hardly necessary for you to summarise it?—I wish to refer to one or two matters relating to the Guardians that were

passed over rather hurriedly at the time. Those were the memorials they sent to the Local Government Board; and I wish particularly to call attention to those memorials and to the matters of fact that are referred to by medical men and by the Guardians themselves. Some years ago the Local Government Board sent Dr. Parsons to ask the Board of Guardians whether, if the Government would guarantee a supply of pure calf lymph, the Board thought that that would remove the objections to vaccination which prevailed in Leicester. Dr. Parsons did not appear before the Board; the message was communicated through the chairman; but the reply of the Board to that was that their opposition was absolutely to the practice itself, and that whatever the source of the lymph might be, it would not moderate the opposition in any sense whatever.

15,540. (*Dr. Collins.*) Referring to the matter of the Guardians, I find on page 445 of the Blue Book of 1871, that in the papers which were handed in by Mr. Seaton, it is stated that Leicester was amongst those Unions that were reported by the inspector as having appointed a Vaccination Officer?—Yes, a Vaccination Officer was appointed there in July 1868. I wish now to call the attention of the Commission to an error which occurs in this return to an address of the House of Commons, dated 14th June 1881, of persons imprisoned under the Vaccination Acts. At page 6 the imprisonments and prosecutions for Leicester and county are given; there is one name, H. M., which is that of Mr. Matts, who has appeared here as a witness, put down as having one imprisonment of seven days, whereas he had three imprisonments of ten days each. There is another name referred to, J. T. P., which is that of Mr. Payne, who has already been before the Commission, who is put down as having two imprisonments of five days on each occasion, whereas the fact is that he had three imprisonments, two of five and one of seven days.

15,541. (*Chairman.*) Was the one of seven days prior to the date of that return?—Yes, prior to this return; the whole of them.

15,542. Are you sure?—Yes, this return was published in 1881. I do not think he has been imprisoned since the passing of the Summary Jurisdiction Act of 1879; and I believe Mr. Payne stated here that the two imprisonments of five days each were previous to the imprisonment of seven days; and as those are there referred to it must be the case. Then in a subsequent return we have a total number of 3,249 cases of prosecution, and I notice, in adding them together on the two lists, there is a total of 4,035; that seems very much below the return that was made to the magistrates, that being 6,037. It is accounted for to some extent by the same parents appearing more than once, but I do not think the whole of the discrepancy is made up in that way. I have not examined them critically, to find out where the discrepancy is; but there is no doubt an error in regard to those two cases of imprisonment, and there is an error in regard to the total number who were prosecuted. The total number given in the two reports, after they are thoroughly abstracted, is 4,110; and the difference between the number referred to in these reports as being imprisoned is four, 57 appearing in the local police report and 53 in the Parliamentary return; and the committals are 57 in the Parliamentary return and 64 in the local police report, a difference of seven. I find that in the summary of proceedings taken, the total number is given as 6,037, which of course includes some which are duplicates. A large number of orders and other proceedings require adding to the 6,037, making over 7,000. This concludes the evidence I propose to offer on the several points I have laid before you up to the present.

Mr.  
J. T. Biggs.  
22 Apr. 1891.

Adjourned till Wednesday next at 1 o'clock.



## Sixty-third Day.

Wednesday, 29th April 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir EDWIN HENRY GALSWORDY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

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15,543. (*Chairman*.) Before you proceed to the statistics, I wish to call your attention to your answer to Questions 15,540 and 15,541. You were pointing out errors in the return presented to the House of Commons. You say: "There is another name referred to, J. T. P., which is that of Mr. Payne, who has already been before the Commission, who is put down as having two imprisonments of five days on each occasion, whereas the fact is that he had three imprisonments, two of five days and one of seven days." Then I ask you, "Was the one of seven days prior to the date of that return?" And you say, "Yes, prior to this return; the whole of them." And in your next answer you say, "I believe Mr. Payne stated here that the two imprisonments of five days each were previous to the imprisonment of seven days." Now on turning to Mr. Payne's evidence I do not find any reference by him to more than two imprisonments, and he does not say anything about one of seven days, but that there were two of five days' each?—The two of five days were consecutive; he suffered them consecutively. One of the two imprisonments he speaks of is the imprisonment of seven days, and the other was the two of five days which he suffered together.

15,544. It may be so, but he does not say so?—As a matter of fact that is so.

15,545. (*Dr. Collins*.) Have you had an opportunity of seeing Mr. Payne's evidence?—Yes, I have seen it. The apparent discrepancy is accounted for by this, that the two sentences of five days each were given at the same sitting of the magistrates; the sentence was given in reference to twins, and instead of giving him seven days for each they modified it to five days for each child.

15,546. (*Chairman*.) Mr. Payne was asked at Question 13,935, "You were first summoned in 1876," to which he replied, "Yes." (*Q.*) You were fined 20s.?—(*A.*) Yes. (*Q.*) You did not pay the fine, but went to prison in December 1876?—(*A.*) Yes. (*Q.*) In July 1878 you were again fined for another child, and again went to prison?—(*A.*) Yes." He speaks there only of two occasions of imprisonment?—Yes, those were two sentences of imprisonment; but one of those cases, the one in 1876, includes two sentences of five days. You could, however, ascertain the facts from him, or from the record of imprisonments which I have already presented to the Commission.

15,547. But you referred to his evidence as establishing an error that you had pointed out?—At that time I had not seen his evidence, but I knew the facts of the case, and I thought it was so. Under any circumstances, however, the two imprisonments, including the double and single sentences, occur before that return is printed, and therefore should appear in the return.

15,548. But the length of the imprisonment is stated as 10 days on one of the occasions; therefore, whether you call it one imprisonment of 10 days or two imprisonments of five days following each other does not appear to be a very important error, does it?—But the

two imprisonments of five days are given in the Government return as two separate imprisonments, and the one of seven days is left out, I believe. If so, the error is important.

15,549. You say it was 10 days on one occasion and seven days on another?—Yes; two terms of five days, and the Government return bears that out, does it not; it states that there were two terms of five days each.

15,550. But it does not show the other?—It omits the other imprisonment altogether.

15,551. One knows nothing of it except from your statement, and I daresay you may be right; did you get the information from Mr. Payne?—Yes, a year or two ago. I have not seen him recently, not since he was here at any rate.

15,552. Now what are the statistics to which you wish to direct the attention of the Commission?—There are one or two questions left over from the last occasion which Mr. Hutchinson wished me to refer to. Shall I deal with them first?

15,553. I think that had better wait till we see whether he comes?—I now come to the final division of my evidence, the statistical division. Before showing the Commission the results of my inquiry into the vital statistics of Leicester, it is necessary that I should offer some explanations. When I commenced the preparation of this evidence two years ago it only appeared possible to obtain complete returns from the year 1862. I afterwards found that it was possible to go 10 years further back, and subsequently I discovered that, although it would involve much labour, it was possible to go back to the year 1838, excepting for vaccinations, which only go back in a continuous form to 1849. I therefore decided to go back to the most remote date possible. The marriages, births, deaths, and deaths from various zymotic causes have been abstracted from the registers 1838-89 or from the first complete year of registration. Small-pox has been taken separately. The Superintendent Registrar has furnished me with part of the figures, which have been checked and corrected to the end of 1889. Other figures have been abstracted from the Medical Officer of Health's reports, where, on comparison with other sources of information, they have been found to be correct. The populations have been calculated on a basis which I will explain later on. I will now hand in Diagram A, with its accompanying table of absolute numbers, given at the foot of the diagram. (*The diagram was handed in. See Appendix III., Diagram A.; facing page 434.*) In this diagram each column represents a year; it shows at a glance the statistics for the full period of 52 years with which we are dealing. Each square represents 100, whether of births, deaths, or vaccinations. The top edge of the blue colour shows the entire number of births for each year during the whole period of 52 years.

15,554. Whether dark blue or light blue?—Yes, to the top of the blue, whether dark or light.



15,555. Is that the actual number?—The absolute number; no proportional rates are given on this diagram.

15,556. Ascertained from what?—From the Superintendent Registrar at Leicester. In regard to the births, there are no disturbing causes requiring adjustment to arrive at true results. In other words, the whole of the births which have been registered in the borough were the births of children belonging to the inhabitants of the borough, excepting those of the nomadic population, which applies to all towns generally. In respect to the deaths, there are several disturbing elements or qualifying circumstances which it is necessary to take into account.

15,557. Before you come to that, what shows the deaths here?—There is a dark line which goes right across the diagram some distance below the top edge of the blue. This line shows the deaths.

15,558. That is the actual number of deaths?—It is.

15,559. Taken from what?—From the actual returns given to me by the Registrar at Leicester.

15,560. Will you now proceed?—In respect to the number of deaths, there are, as I say, several disturbing elements or qualifying circumstances which it is necessary to take into account. For instance, the county lunatic asylum is within the borough, and the whole of the deaths occurring at that establishment are the deaths of persons who do not belong to the borough population. It is, therefore, necessary to exclude them in any calculations we may make, although for the purposes of district registration, and so far as the Registrar-General's returns are concerned, they are included in the borough mortality.

15,561. But they would not be all excluded, I suppose; some of them, I suppose, would come from the borough?—Yes, a few at that time, but none now go from the borough to this institution. The county lunatic asylum is a separate establishment from the borough lunatic asylum. The same observation is partly true as regards the Infirmary and Fever House, both of which institutions are supported by voluntary contributions and donations, and receive patients from the county as well as from the borough itself. It is necessary, therefore, also to deduct the deaths of all county patients occurring at these establishments, although they appear in the Registrar-General's return as the deaths of inhabitants of the borough.

15,562. Has there been any great change in the number of those, or would they be about the same proportion throughout?—They vary, but there is no material change; I will show the differences a little later on. It is probable that in the earlier years dealt with on this diagram these deductions have not been properly made, and therefore the death-rate for those years is possibly slightly higher than it should be. The deductions or corrections were first referred to by the Medical Officer of Health in 1855, but in the calculations which I am about to submit, they are first made in the year 1856, and therefore from that year the deaths which are shown on this and subsequent diagrams and tables are corrected; that is, the deaths of persons belonging to the county but dying within the borough are excluded. Since 1871 and 1872, when the great epidemic from small-pox occurred, there has been another disturbing factor, the Fever Hospital for borough patients being erected outside the borough boundary upon Freake's ground.

15,563. (*Dr. Collins.*) What was the date of its erection?—It was erected in 1871.

15,564. (*Chairman.*) Was it occupied in that year?—It was not occupied until the following year. It was not completed until 1872. From this date, therefore, it became necessary to add to the mortality of the borough the deaths of borough patients occurring at that establishment. These deaths are registered in the Blaby Union, and appear in the Registrar-General's returns as though they were deaths of inhabitants of a parish in that Union. In addition to this, since the year 1869 another disturbing element arose by the erection of the borough lunatic asylum outside the borough boundary. From this year it became necessary also to add the deaths of patients at this institution to the deaths occurring in the borough, so as to obtain a true record of the borough mortality. To show that this has been the constant practice, I might read one extract from the report of the Medical Officer of Health, Dr. Crane. One of the first refer-

ences made to this matter is in the report for 1867, where the Medical Officer says: "The number of deaths registered as occurring in the year 1867 is 2,119. From this number there ought to be deducted 54, namely, 25 who died in the Infirmary, 25 in the lunatic asylum, and four in the Fever House, who came from distant parts and had not previously at any time been resident within the precincts of the borough." Referring to the previous Medical Officer, he says: "Although Mr. Moore did not fail to note these deductions yearly, yet as he did not actually subtract them from the gross mortality in making his calculations, I feel myself compelled to follow his example, or otherwise the comparisons which I shall have to make with his figures, would be essentially unsound and consequently valueless." In my judgment this conclusion of the Medical Officer is "essentially unsound"; and I have not followed his example.

15,565. That will apply to all your figures before the date when you made the comparison, that is to say, the comparison with these figures?—I have already explained that previously to 1856 these figures are not corrected on this return. Almost at the commencement of every year's report similar observations are made, and I have abstracted a few of the differences which I thought it would be well now to point out to the Commission. For the year 1867 there is a decrease of 54 deaths from the returns by the Registrar-General; for 1868 there was 62 decrease; for 1869 there was 48 decrease; for 1870 there was 58 decrease; for 1876 there was 83 decrease; for 1878 there was 44 decrease; for 1881 there was 23 decrease; and for 1882 there was an increase of 2; for 1883 there was a decrease of 27; and for 1884 a decrease of 32 from the Registrar-General's returns.

15,566. Upon what sort of number are those decreases taken?—The total deaths for 1884, after correction, are 2,937.

15,567. It would be something like 50 or 60 on something approaching 3,000?—I think you will find the deaths never exceed 3,000. They are the highest in 1880, and in that year they are just under 3,000. Last year (1889) there is a difference of 60. The borough lunatic asylum was opened upon the 2nd of September 1869, the patients were formerly placed at Peckham and Birmingham, and some in the Leicestershire and Rutland county asylum, which is within the borough, and a few at other places.

15,568. If you take 1 to 1½ per cent. off the earlier ones that would probably make the deaths comparable, would it?—I should think that would be fair. It would be rather below than above the average. That which I have stated will fully explain to the Commission the basis upon which this diagram and indeed all the diagram and tables which I propose to submit to the Commission are prepared, and in these respects they will be found to differ slightly from the Registrar-General's reports. There is also another matter which should be named before I pass from the consideration of the registered births and deaths. The records which I submit have been furnished to me by the Superintendent Registrar at Leicester, and commence from the 1st January in each year, ending with the 31st December. In this respect also they will vary somewhat from the returns of the Registrar-General. On examining his reports I found that some year's returns made by him included 53 weeks, and others only 51, and I also find that it is his practice to begin his returns with the first day of a week and end with the last day of the week whether or not the beginning or the end of those weeks coincide with the beginning or the end of the year.

15,569. Do you get your figures from the Superintendent Registrar so far back as the year 1838?—Yes. There are two discrepancies relating to Leicester in the 35th annual report of the Registrar-General to which I should just like to refer for one moment to illustrate these differences. At page xciv he gives the births for the 52 weeks ending the 28th December 1872 as 4,085, while in the same report in the abstracts at page 68 they are given as 4,152, a difference of 67. I do not know how this arises. Then the deaths are given at page xciv as 2,658, and in the abstracts at page 68 they are given as 2,677, a difference of 19. I thought it just as well to point out that there are some discrepancies even in the reports of the Registrar-General.

15,570. It may possibly be that in the latter case it is taken to the end of the year and not to the 28th of

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December?—If this be so then the Registrar-General's tables would be very confusing, some ending with one date, and some with another. In respect to the births for 1872 there is a difference of 10 between the highest number given by the Registrar-General, and the number given me by the local Superintendent Registrar. If you look upon the diagram for that year, 1872, you get 4,162 births, so that you will see it is 10 above the highest number given by the Registrar-General, which was 4,152.

15,571. He, taking 52 weeks to the 28th of December, would take in two or three days from the previous year?—Yes, that might account for a part of the difference, but the principal variation was 67, which struck me as remarkable. Our local Registrar gives 4,162 births for 1872, being 10 more than the highest number of the Registrar-General, and 77 more than the lowest. For the deaths our local Registrar gives 2,676, being one less than the Registrar-General's highest number, but 18 above the lowest number.

15,572. What is the meaning of "West Leicester" "H.H.L." and "East Leicester W" in the Registrar-General's report?—The "H" means hospital, and the "L" stands for the lunatic asylum in the district, and the "W" for the Workhouse.

15,573. Meaning that the deaths in those institutions are included?—It means that such institutions exist, and that the deaths occurring there are included.

15,574. Possibly they were excluded in the earlier table, page xciv?—Although I have examined the report I am unable to find any intimation to that effect. The corrected number of deaths is 2,648, being 10 below the lowest and 29 below the highest number given by the Registrar-General for 1872. Similar variations will apply to most of the years, and while they do not materially affect the general results they do influence them somewhat when taken annually; especially the death-rate when considered with the corrected populations.

15,575. Your return differs somewhat from the return given by the Officer of Health for Leicester, he gives for the year 1872 eight less births than you do?—The Medical Officer, there is no doubt, adapts his figures to those of the Registrar-General and not to those of the local Registrar, although both the latter ought to agree.

15,576. But that would not be so upon that occasion, the number of 4,154 is not found in the Registrar-General's return?—His number is 4,152; but the Medical Officer of Health gives two more, so that they are not quite alike.

15,577. These are something between the two?—The reason these errors crop up in different official reports, as I noticed in casting from 1838, was that they take the four quarters and add them together so that they are liable to make a mistake of four if they are not very careful in making the deductions. I think that would explain it partly. Now, proceeding with my description of the diagram, the dark upper line stretching across Diagram A. represents the total deaths. The difference between that line and the top of the blue line represents the natural addition by births to the population in each year.

15,578. Is the black line taken from the Superintendent Registrar?—Yes, the figures represented by the black line were supplied to me by the Superintendent Registrar. Resuming my statement, the part of the diagram coloured red shows at a glance the entire amount of vaccination performed upon the children born in each respective year from 1849 to 1889 continuously.

15,579. Where is that taken from?—The Superintendent Registrar for Leicester is my authority for the number of vaccinations.\*

15,580. The Superintendent Registrar of what?—Of births and deaths.

15,581. Do you mean that those are the vaccinations returned to him?—Yes; those sent to him by the Public Vaccinators, and the Vaccination Officer, he being clerk to the Guardians.

15,582. But does the number of vaccinations mean the number of persons vaccinated of those born in that year, or of those vaccinated in that year?—They would be the vaccinations of the children born in each year.

15,583. But that is not so, is it, throughout, because I thought in some of the earlier years the tables which were first put in (handed in by Mr. Chamberlain, I think) were not made up upon that basis?—I believe Mr. Chamberlain gives an explanatory note of the basis he adopted, and for which he is responsible. -

15,584. For example, in 1858 the births were under 2,300, and the vaccinations in 1858 are put down in the table we have had handed in as a much larger amount than that?—I think not. You will find the number of vaccinations on Mr. Chamberlain's Table A. given as 2,026. If your Lordship will refer to the year 1863-64, when a large number of "extra vaccinations" took place, you will find that the number of vaccinations upon children born within that year are given, and then an additional number is also given accounting for the additional vaccinations which took place in 1863-64.

15,585. Has that principle been followed throughout from 1849, do you know?—Perhaps I had better read the letter addressed to me on the 28th December 1889 by the Superintendent Registrar of births and deaths, who is also clerk to the Guardians. "Dear Sir, Here-  
"with I send you a complete return of the births,  
"deaths, and marriages registered in the district of  
"Leicester (which comprises the whole borough) from  
"1837 to 1888. In a few weeks I shall be able to add  
"the figures for 1889. In reference to the vaccinations  
"I am unable to furnish the exact figures from 1849 to  
"1862, but after that year the registers are complete.  
"Owing to the loss of the register for the district of  
"West Leicester the exact number of private vacci-  
"nations for the above-mentioned period (1849 to  
"1862) cannot be ascertained, but they can be arrived  
"at approximately on the basis of the numbers vacci-  
"nated from 1863 to 1867. As there were fewer  
"vaccinations than usual in these years (with the  
"exception of 1864), you will be quite safe in taking  
"these approximate numbers, as they will be below  
"the actual numbers vaccinated. The returns I for-  
"ward are entered as 'under one year' and 'over one  
"year,' but those entered under the latter column  
"were mostly children, the number of re-vaccinations  
"being very small. As the returns end with Sep-  
"tember 30th in each year, it will be necessary, in  
"order to obtain the numbers from January 1st to  
"December 31st, to adjust the figures by deducting  
"three months returns off each year, and adding the  
"figures to the returns of the preceding year. Trusting  
"the information I have given will enable you to  
"complete your tables and diagrams.—I am, dear Sir,  
"Yours faithfully, LIONEL P. CHAMBERLAIN."

15,586. I do not gather that that shows that the number in each year is the number vaccinated of those born that year; on the contrary, it seems to include re-vaccinations?—Possibly a few, but very few.

15,587. We should have to inquire how many there were. In the years 1871 and 1872 I should imagine there would be a good many re-vaccinations in Leicester, would there not?—I am not able to say at present, but I will ascertain that. Those figures referred to in Mr. Chamberlain's letter relate more to the earlier period.

15,588. One must know exactly what are the figures that we have, whether they are the figures of all the vaccinations effected in the particular year, or whether they are only those vaccinations which were effected in the case of children born within the year. I understood you to say the former, but Mr. Chamberlain's return would certainly seem to say the latter?—No. He says, "those entered under the latter column were mostly children."

15,589. Mostly children, but not necessarily children born in that year. I should imagine a child was never vaccinated twice in the same year. If there were re-vaccinations at all they would be the re-vaccinations of children born in some previous year?—The re-vaccinations, if any, would in all probability apply to those born in a previous year.

15,590. And some of the others might?—I do not think they would to any appreciable extent, because the vaccination returns, especially since 1868, as I have just stated, relate to the births of each of the subsequent years.

15,591. But surely many children would not be vaccinated till they were six months old?—That is the case with the children referred to in these returns.

\* The vaccination figures referred to in this day's evidence, Questions 15,579-706, were those previously handed in by Mr. L. P. Chamberlain, for which he was responsible.—J.T.B.



15,592. But supposing a child born in the middle of August, say of 1860, were vaccinated in February or March 1861, would that child appear amongst the number vaccinated in 1860 or 1861?—From the information given me by Mr. Chamberlain, I should suppose its vaccination would appear in 1860, in this table.

15,593. That may be so, but I do not understand that from Mr. Chamberlain's return?—Possibly not, but from 1868 I can explain it more particularly.

15,594. But you do not make this out yourself; you get it from Mr. Chamberlain, I understand. We must understand exactly what it is you are telling us. I am not reasoning upon it at all, I only want to understand it, because it may make a difference as one can conceive in certain aspects, if some of the vaccinations are referable to births in a preceding year or years?—Mr. Chamberlain did offer some explanations, I think, upon that point when he was here, showing how far the vaccinations increased after the 31st December in each year, and the whole of those which are shown here after 1867 are the corrected returns as sent to the Local Government Board.

15,595. Corrected to what?—To the close of the year by the supplementary returns. Take any one of the years, for example, take the year 1874. I do not pick that out particularly, but at the close of the year 1874 very few of the children who had been born in the last three, four, or five months would be vaccinated in that year, but nearly all of those left unvaccinated would be vaccinated within the following twelve months. The whole of these returns are corrected up to June 30th of the year following, and are again corrected six months afterwards so as to include all the children born in the preceding year but not vaccinated until this time.

15,596. And all children born in the remaining part of that year will be referred back to 1874?—Yes, they would be referred back if they were born in 1874 but vaccinated in 1875.

15,597. Then this would refer to all the children born in that year, excepting so far as they were re-vaccinations?—Yes, if you would look upon my diagram at the year 1889, there are 127 total vaccinations given for that year; the figures originally given to me were 101, before the further return six months later had been made out, but when this later return was made out, as Mr. Chamberlain explained, the number had grown to 127. These 26 additional vaccinations were those of children who had been born in 1889 but vaccinated in 1890, and that principle applies to the table throughout from 1872.

15,598. Is there any record kept of re-vaccinations?—I do not think there is for the earlier years, excepting those which may appear on the papers sent in to the Guardians by the medical officers.

15,599. So that there is nothing here to show what the number of re-vaccinations would be?—No, nothing whatever, but they would be very few in number from what I have been given to understand by the local Registrar.

15,600. But some are recorded; those would be by the Public Vaccinator, I suppose?—Yes, they would be recorded by the Public Vaccinators in the way I have just mentioned.

15,601. Did they make returns?—Yes, they did, and they continue to make returns, which include re-vaccinations. The Registrars of births and deaths kept the vaccination registers up to the end of the year 1871; but the Act of 1871 made the Vaccination Officer the registrar of vaccinations, and from that time I do not think that re-vaccinations are shown at all in his returns, although Mr. Chamberlain might have the numbers.

15,602. Would you let me look at Mr. Chamberlain's letter for a moment?—You will find that the letter makes a reference to re-vaccinations and says the number would be "very small."

15,603. (Mr. Picton.) Is it not a fact that the registrar has to clear up his book for the year, to ascertain what proportion of the children born in the year are left unvaccinated?—Yes.

15,604. Then he sends up to the Local Government Board what proportion of children born in the previous year have been vaccinated?—Yes, he does that periodically, and they are then included in the years in which they were born.

15,605. Those are the numbers recorded here?—Yes.

15,606. (Dr. Collins.) I find in the 18th Report of the Local Government Board, in the supplement containing the report of the Medical Officer, this passage: "Vaccination officers' returns are made up to January 31st of the year but one following that to which the returns relate. The interval between birth and return must therefore always be a twelve-month and something more. This 'something more' may be as little as one month or as much as 13 months, according as the child is born at the beginning or end of each calendar year." So that the practice of referring back subsequent vaccinations to the previous year is the practice elsewhere than in Leicester?—No doubt. It is the general practice all over the country; the numbers are correctly returned, in the first instance, up to date, but the principal supplementary return is usually sent in during August of the following year, and includes the vaccinations of children born in the preceding year up to the 30th of June. A further supplementary return is made out usually in February of the following year, being at least 13 months after the close of the year to which the original return applied.

15,607. (Mr. Meadows White.) Does the registrar do that by certifying the child whose vaccination is returned to him upon the same certificate with that child's register of birth?—Yes, the vaccination registrar enters the vaccination against the name of the child given to him by the registrar of births.

15,608. The birth of each child is registered?—Yes, by the registrar of births.

15,609. The vaccination of each child is certified to the registrar?—Yes, to the Vaccination Officer.

15,610. But the certificate does not mention the date of the birth, it only mentions the name of the child. Is your table compiled from that prepared by the registrar identifying the child whose birth is registered with the child which is vaccinated?—Yes, it is prepared from the completed register of the vaccinated births.

15,611. He gives the notice and then registers the vaccination against the birth?—Yes, they are all entered by the Vaccination Officer with the date of birth and the date of vaccination; then he has to make a return to the Local Government Board of the vaccinated and of those remaining unvaccinated, in accordance with the order of that Board.

15,612. (Chairman.) This is to some extent approximate, is it not? Mr. Chamberlain says, "As the returns end with September 30th in each year, it will be necessary, in order to obtain the numbers from January 1st to December 31st, to adjust the figures by deducting three months' returns off each year, and adding the figures to the returns of the preceding year." Does he mean by dividing by four and deducting or adding?—Mr. Chamberlain is alluding to public vaccinations only, and that is how his figures for 1849-67, both inclusive, have been adjusted, as it is impossible to get the absolute numbers from the 1st January to the 31st December until we come to the year 1868, owing to the way the official returns are prepared.

15,613. To that extent, therefore, it is an estimate. Take, for example, the year 1854, there are 377 added and 509 deducted, the mean is arrived at by dividing in each case the figure of that year and the subsequent year by four?—Yes; he is adjusting the annual public vaccinations, and so far it is a fair approximation rather than a mere estimate, but taking the years altogether you get the absolute number. From 1872 onwards, you get the actual number correctly from the 1st January to the 31st December for each year.

15,614. I see in the year 1864, for example, there were a very large number of vaccinations; they were vaccinated it is said in consequence of an epidemic which was raging; what was done there; was there just the fourth deducted from that?—In 1864 there was a large number of what we term "extra vaccinations," that is, vaccinations of children and others whose vaccination had been deferred, but if you look at the bottom of my Diagram A. there is an explanatory note referring to these and giving their number.

15,615. But the year 1864 is on the diagram?—Yes, and at the bottom of the diagram you will find a note made referring to these as "extra vaccinations." We do not deal with them in colour on the annual diagrams,

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as I found this was impossible; but they will be shown on all my quinquennial diagrams and tables.

15,616. But how do you know these are all what you may call extra vaccinations?—They are shown to be so upon comparing the official records.

15,617. Were they all re-vaccinations?—No, they certainly were not all re-vaccinations, even if any of them were.

15,618. Then what do you mean by their being "additional" if they were primary vaccinations?—By far the largest number of them, even if not all, were primary vaccinations of children whose vaccination had been omitted in preceding years.

15,619. I thought this return only had relation to the number who were born in the particular year?—Yes, generally speaking it is so, but this number we have here as special vaccinations had been neglected in the previous years altogether.

15,620. How do we know that there were not similar vaccinations of omitted children which swell the number in preceding years?—If there had been any they would have been private vaccinations, and there would have been no register of them in the public records.

15,621. If we take the year 1864, the number vaccinated is put in this return of Mr. Chamberlain's as being 5,853; of those you say a good many were primary vaccinations of children who had been omitted in previous years. Why may that not be applicable to the 1,445 in 1867—some of them at all events?—It may be so. The returns are made out in three columns upon the sheets in your hand which give the number vaccinated for the year 1864. From the total given by the Public Vaccinators Mr. Chamberlain has deducted the number ascertained from the vaccination registers. The remaining number we have termed "additional" vaccinations."

15,622. The number vaccinated in 1864 appears as 5,853, just as the number vaccinated in 1867 appears as 1,445. It is true you say in the last column that 3,928 additional vaccinations took place in 1864, but they are dealt with in the same way in the return?—They are not in any way distributed amongst the preceding years.

15,623. (*Dr. Collins.*) Would not additional vaccinations mean the vaccinations of children of more than one year of age?—Yes, it would, in this instance.

15,624. (*Chairman.*) How do I know that among the number of 1,445 there were not some vaccinations of children of more than one year of age?—Because from 1849 to 1867 they are all entered upon one basis, but these "extra vaccinations" are altogether distinct from those which are given in the medical registers.

15,625. But they are not included in your return, whereas, as I understand in the return which Mr. Chamberlain sends to you, those 3,928 were included in the total number vaccinated in the year 1864, just as the others are?—We exclude them from the annual diagrams only because they were the vaccinations of children whose vaccinations had been left over, but they are included in all the quinquennial diagrams.

15,626. May there not be some who ought on exactly the same grounds to have been excluded in other years?—I do not think so, because the large number vaccinated in 1863-4 would have cleared up all arrears of vaccination up to that date.

15,627. What I want to know is whether we can rely if we find a number here on its being the vaccination only of those born in the year?—That is so for the most part upon my Diagram A.

15,628. But you have got your materials for this chart from Mr. Chamberlain and he does not exclude this 3,928?—I do not exclude them because I make a note calling attention to them at the bottom of the diagram.

15,628a. (*Chairman.*) It does not show me at all events that there may not be similar cases upon a smaller scale in subsequent years: take the years 1871 and 1872, for example?—If there had been any the registrar would no doubt have entered them.

15,629. (*Mr. Picton.*) Is it not the case that since 1871 those are the numbers sent up to the Local Government Board as representing the children that were born and were duly vaccinated belonging to each one of those years?—That is so, and I have taken them wholly from the official returns.

15,630. (*Chairman.*) But does that only date from 1871. I thought you said it applied throughout; we must get to see exactly what the basis of these figures is?—By the Act of 1871 the Vaccination Officer was made the registrar of vaccinations, and he furnishes the record to the Local Government Board. Prior to that time the local registrars kept the vaccination registers, and in them the vaccinations are shown continuously in the way I have explained to you. For that particular year, 1864, ending with September, and, therefore, embracing the last three months of 1863, the registrar says he finds the number of vaccinations furnished by the Public Vaccinators' returns, after deducting the private vaccinations, to be 3,000 or 4,000 in excess of those entered in the vaccination registers. These two sets of returns are entirely distinct from each other; and this fact would partly account for some apparent confusion in the figures.

15,631. How many have you for the year 1864?—1,196. In all 5,853 public vaccinations are given in the official medical returns, but the vaccination registers only give a total of 1,925 for both public and private vaccinations.

15,632. But in the document you handed to me just now the 1,196 are all under the head of "public vaccinations"?—Yes, that is so, and I show mine under this head.

15,633. The 1,196 in 1864 is all "public," is it?—Yes; and we could not have got at these figures unless the registrar had kept a separate register.

15,634. From the paper I have here I see that this is how Mr. Chamberlain arrives at it: Number of births in 1864, 3,092; number vaccinated, 5,853. Then in the margin he puts down the 5,853; from those he deducts the 1,925, which you give as your total, leaving 3,928, which are described as "Extra." Then he corrects the 1,925 by deducting one-third from it, bringing it down to 1,283; from those he deducts 321 as representing the vaccinations of the final quarter of the preceding year, bringing the 1,283 down to 962. To those he adds 234 as representing a quarter of the vaccinations of the following year, bringing the total up to 1,196. That is how he arrives at his 1,196, by a process of calculation which is not quite clearly explained, but it amounts to striking out three months of that year and inserting three months of the next year?—Yes, your Lordship has clearly described the plan he has adopted. I see Mr. Chamberlain puts down the 5,853 and then deducts from it the 1,925 (the total he had obtained from the register) leaving, according to his calculation, 3,928 as "extra."

15,635. (*Sir James Paget.*) Is the same rule followed in all the years?—In all the years up to 1867 inclusive, these adjustments have been made for the public vaccinations. There is nothing to interfere with the continuity of these returns excepting these "extra vaccinations" in 1863 and 1864, which, as I have explained to you, are due to the special efforts of the Guardians to secure completer vaccination in consequence of the epidemic of small-pox, which was then raging.

15,636. (*Chairman.*) It may be that the number being very large that year he has dealt with them in this way and deducted them, but that in subsequent years the number of extra vaccinations not being very striking, he has not done so?—Your Lordship's suggestion is probably correct, although so far as I know there is nothing of that kind which occurs in subsequent years.

15,637. Do you mean to say there were no postponed vaccinations after the year 1864?—Nothing like 1864. There might be some, but they would only occur in the way I have mentioned.

15,638. Leicester must be a very extraordinary place where there are no vaccinations postponed beyond the due time?—No doubt it is an extraordinary place in respect to vaccination, but I have explained that there may be some. The returns made to the Local Government Board comprise the vaccinations of children born in the preceding year, who were vaccinated up to June of the following year, and even later still.

15,639. I understood you to say that we could rely upon it after 1871. What we want to see is, whether in every year prior to 1871 the same process has been followed, because, unless you have the cardinal fact to make it perfectly clear, we had better have Mr. Chamberlain?—Mr. Chamberlain, if he were here, might possibly explain his figures satisfactorily.



15,640. (*Mr. Meadows White.*) I want to know why these extra vaccinations should not have appeared somewhere if they are not re-vaccinations. I can understand re-vaccinations not appearing, but if they are primary vaccinations why do not they appear somewhere, if not in the year preceding, then in the year preceding that, if the child was an older child?—The “extra vaccinations” do appear in all my quinquennial diagrams, and they are always referred to, although not shown, on the annual diagrams.

15,641. (*Chairman.*) That seems to indicate that the annual chart may represent the vaccinations of the year; but if there are postponed vaccinations, as one may presume there are, then as representing the general condition of vaccination, at any moment, the diagram is of no value, is it; that is to say, if the postponement prevailed to any considerable extent?—If it could be proved to have prevailed to any considerable extent that might lessen its value; but I think you will find that it did not prevail at all except in this particular instance. But even if it did prevail one year would fully compensate for another. You will see that it would have been very difficult, if not absolutely impossible, to distribute this large number of “extra vaccinations” over the preceding years.

15,641a. (*Chairman.*) I am not blaming you, but when we are dealing with the diagram we cannot, by any consideration of its being difficult, relieve ourselves from the necessity of seeing that it is right?—I do not wish you to do so, but I am convinced that you will be fully satisfied when I have further explained how the whole of the vaccinations have been dealt with.

15,642. (*Mr. Meadows White.*) Supposing these 3,928 children were only about one year old, instead of being excluded their vaccinations ought to appear in the two years preceding in the annual column?—To my mind it would look absurd in the annual column to fill in a large number of vaccinations which so far exceeds the number of births, especially in a table showing for the most part the vaccinations of the births.

15,643. That would only go to show that you had not distributed them sufficiently?—I do not see how they could have been dealt with otherwise. The numbers are registered before they are paid for by the Guardians.

15,644. If the registrar knows the age of them, and he says he does because they are mostly children, it must have been perfectly possible to see to which year they were to be allotted?—I do not think he knows the age so accurately as to be able to do that.

15,645. (*Dr. Collins.*) Would he not probably infer it from the fact of their being primary vaccinations and not vaccinations of children under one year?—I think he would, because no doubt that would be so to a very large extent.

15,646. Even deducting the 3,928 extra, 1864 was a high year as regards primary vaccinations with its 1,925?—It was, being higher than any year since 1858.

15,647. Your point, I understand, is that some distinction or other is made by the Vaccination Officer which enables him to say that there were in that year these extra vaccinations, and you presume that these were cases in which primary vaccinations were performed by the Public Vaccinator upon children who were more than one year of age?—The registrar himself furnished me with the information to that effect.

15,648. (*Chairman.*) Now proceeding with the description of your diagram, what are these red columns you give for the years 1844 and 1845, the red columns of vaccination, where do those come from?—Those red columns represent figures abstracted from letters which appeared in the Guardians' evidence and which are referred to in their correspondence with the Poor Law Board, but the figures for the intervening three years are not given.

15,649. You have spoken of public vaccinations hitherto; where do you get the private vaccinations from, also from the registrar?—I get them also from the registrar. All my information respecting vaccination comes from him. The figures of a very large number of these years have been printed in the returns already issued by the Local Government Board.

15,650. Supposing there were unvaccinated children which during the time of the epidemic the parents might have desired to have vaccinated, would there necessarily be any register of such vaccinations?—Yes, speaking generally.

15,651. Why?—If they were vaccinated by the Public Vaccinator it would be his duty to register them.

15,652. But only as he would register everybody?—He would register all who were vaccinated.

15,653. But all those who would be done by private practitioners would not be registered?—The re-vaccinations by private practitioners would not, but the primary vaccinations would be registered.

15,654. Supposing children may not have been in the district; there is a great deal of non-vaccination arising, is there not, from parents changing their neighbourhood and going to live in other places?—Yes; and that is done sometimes to avoid the Vaccination Officer.

15,655. Then supposing a private practitioner vaccinated a child of four or five years old brought to him in a time of epidemic, he would not necessarily make any return of that, would he?—Possibly not prior to 1868, especially if the child had been born in another district. But after 1868 all such vaccinations are supposed to have been referred back to their own districts.

15,656. It would be only where the child would come in in the ordinary course of proceedings under the Act?—Yes, that would point to the possibility of a few vaccinations which might not be shown here.

15,657. I mean in times of epidemic especially; one sees what happened in 1864, and I suppose in 1871, 1872, and 1873 there was probably a good deal of the same kind of thing taking place in Leicester as we know took place in other towns, of people who had not been vaccinated before or were doubtful about it, seeking to have their children or themselves vaccinated. There would be no record of that except so far as the Public Vaccinator performed the operation?—That would be so to a certain extent, in respect of those coming to Leicester from other districts; but, on the other hand, there are instances of the entries of such cases without the date or place of birth being given.

15,658. (*Dr. Collins.*) Such cases would probably have been infrequent since 1871?—Yes, very infrequent since 1871.

15,659. (*Chairman.*) Does that conclude all the explanation you wish to give of the portion of these tables which shows the vaccinations?—Not quite. I have a little further explanation to offer with regard to the vaccinations. It was only possible to obtain one or two returns before the year 1849, and the figures from these are shown on the diagram for 1844 and 1845, to which your Lordship has already alluded. It is obvious, however, that no very accurate calculations can be based upon these odd returns, because they are not continuous, and the private vaccinations are omitted. The dark red colour gives the amount of public vaccinations performed, while the lighter red colour represents the number of vaccinations performed by private practitioners. You will observe that these vary considerably, and you will also notice the enormous rise in total vaccinations which took place in 1868 on the appointment of our Vaccination Officer. What has surprised me, and will probably surprise the members of the Commission, is the large amount of vaccination which took place prior to 1868.

15,660. There is one thing that strikes me as extraordinary upon these tables, if this is a record of the actual number; that in the year 1867 whilst there are a large number of vaccinations by Public Vaccinators the private vaccinations were only 18, that seems hardly conceivable?—That is the number which, I suppose, Mr. Chamberlain obtained from the vaccination registers.

15,661. Does not that suggest that there must be some mistake there, that there should only be at that time when there was no general feeling against vaccination, certainly not amongst the classes employing private practitioners, only 18 children vaccinated by other than the Public Vaccinator in that year?—It does seem a very small number, but I suppose Mr. Chamberlain felt bound to take the figures as they stood in the official registers.

15,662. But one must look into them; you are quite right to take them, you take what you can get, but when one has to make use of them one must go a little deeper than that. Take also the year 1862, when the number vaccinated by private practitioners was 30?—I think these matters were referred to before, when the returns were first presented to the Commission by the clerk to the Guardians, who pointed out the great variations in the number of private vaccinations in his tables.

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15,633. In the subsequent year, 1868, you say a Vaccination Officer was appointed, but in the previous year, 1866, there were 281 vaccinated by private practitioners; the drop is unintelligible from 281 to 18. Then in 1886—?—In 1886 Mr. Chamberlain shows only 39 private vaccinations registered.

15,664. But at that time, of course, there was more or less opposition?

(Witness.) Yes, but if you compare the year 1884 with the year 1886 you will find that there is an enormous difference even here, the fall being from 924 to 39, according to Mr. Chamberlain's Table C.

(Sir James Paget.) Compare the years 1861 and 1863 with 1862.

15,665. (Chairman.) I cannot help thinking there must be something that needs a little probing in these figures for the private vaccinations: in 1861, 269; in 1862, 30; in 1863, 364; or if you take 1869 there were comparatively few private vaccinations, whereas in 1875 there is a very large number. If you take it from 1849 to 1861 it varies from the highest, 377, to the lowest, 226, and then with only that variation from 377, highest, to 226, lowest, it suddenly drops down to 30. Then the next year it goes up to 364, which is something more like the normal amount?—But if you notice there is the superintendent registrar's explanation of his tables in the letter I read; he said (if you will permit me to read it again): "In reference to the vaccinations I am unable to furnish the exact figures from 1849 to 1862, but after that year the registers are complete. Owing to the loss of the register for the district of West Leicester the exact number of private vaccinations for the above-mentioned period (1849 to 1862) cannot be ascertained, but they can be arrived at approximately on the basis of the numbers vaccinated from 1863 to 1867." I may say, speaking from memory, that there were found to be about one private vaccination to every  $4\frac{1}{2}$  or 5 of public vaccinations.

15,666. Then that is arrived at by taking the year 1867, which is in itself apparently a most extraordinary and abnormal year?—But, on the contrary, 1864 is very high, and thus more than compensates for the low number of the year 1867.

15,667. I do not see how that gives it for the separate years. If you take an average, when you are arriving at your total by adding an approximate estimate derived from subsequent years, why should not that approximate estimate be exactly the same in the years you are taking it for?—The proportion, I believe, was arrived at by Mr. Chamberlain upon the basis of the numbers found registered from 1863 to 1867, both inclusive.

15,668. But finding the proportion from 1863 to 1867 of private vaccinations to public vaccinations, you average that, I suppose?—Yes, we have taken the average.

15,669. And then add what you find is the average to the previous years?—Yes, an average of the private vaccinations was added to the public for the total vaccinations.

15,670. If you have done that how do you find only 30 in one of the previous years?—I do not think you do find 30 in one of the previous years upon which the calculation is based.

15,671. Yes, you do, in 1862?—He mentions that year, but it is not included in his calculation. That number is obtained from the register.

15,672. I thought the registrar said in his letter he had not the figures accurately from 1849 to 1862, but that you could correct it approximately by inferences derived from 1863 to 1867?—The registrar says "from 1849 to 1862"; and I think he means exclusively of 1862.

15,673. (Dr. Collins.) May it not be that the deficiency he has had to make good only applies to West Leicester, for which he speaks, and that the others are taken from actual facts?—Yes, the deficiency is only for West Leicester, and for the years mentioned in his letter.

15,674. (Mr. Picton.) Are they added in these figures?—Yes, the private vaccinations prior to 1862 are added to the public vaccinations upon that calculation.

15,675. (Sir James Paget.) What is the proportionate estimate of the private vaccinations to public vaccinations?—The proportion for the years to which he refers would be about 1 to  $4\frac{1}{2}$ , or 5.

15,676. But that does not occur in any year?—He takes the average of the years 1863 to 1867; the proportions in this period are about 1 to  $4\frac{1}{2}$  or 5, and he applies this proportion to the previous years.

15,677. (Sir William Savory.) You could hardly call these statistics under those circumstances?—Yes, we can, because although the register of one district is lost, the other registers in existence bear out those figures; the Registrar explains here that he is somewhat below rather than above the actual number of vaccinations.

15,678. (Mr. Bright.) You mean the registers of the other districts show the proportion of 1 to  $4\frac{1}{2}$ , and, therefore, you take this West Leicester district as presumably the same?—That is so, but for the years from which this proportion has been obtained the registers for both districts are in existence.

15,679. (Chairman.) He does not say he did that; he corrected the returns from something calculated by him between 1863 and 1867, and not from the district in which he had the figures?—No; but I say the complete registers do exist for the whole of that period for both districts. The registers for West Leicester only were destroyed for the previous years, and this is a very small district compared to the east district. But I ought to say that the west district has grown considerably lately, and is growing now very rapidly.

15,680. It would be satisfactory to have it if you can tell us by actual figures at all, what has been added by reason of the estimate in each year?—I am afraid I could not tell you that to-day.

15,681. You got it, I suppose, in order to make this diagram?—Yes, I got it from the registrar, but I have not his calculations with me.

15,682. (Sir James Paget.) The numbers upon this diagram are by calculation, not by record?—No, they are by record for the whole of the public vaccinations.

15,683. But for the private vaccinations by a calculation of 1 to  $4\frac{1}{2}$  of public vaccinations?—Yes, from 1849 to 1862 only, but for all the other years they are by record.

15,684. Ought there not to be a note to that effect on the diagram that they are not recorded but computed numbers, because the number of total vaccinations is also estimated?—Only partly so, and for the years mentioned. An explanatory note is given on Mr. Chamberlain's table. It is now recorded in the evidence, and if you wish it a note could easily be added to my diagram.

15,685. (Chairman.) Private vaccinations apparently for many years are almost exactly one fifth of the public vaccinations, that must be an estimate; that cannot be a record?—For which years?

15,686. From 1849 to 1861?—I have already explained that this is so.

15,687. I understand now that that fifth is taken from what you find to be the case between 1863 and 1867?—Yes, and based upon the numbers given for the years for which complete registers exist.

15,688. But does a complete register exist in 1862?—I think it does.

15,689. If so, why do you give for the purpose of your calculation the years 1863 to 1867, and leave out the year 1862?—If that is in the registrar's letter, I think he is wrong in the dates he has put down.

15,690. You do not follow the question. Supposing it is correct, and that 30 is the recorded number for 1862, that the records begin in 1862, and that you have records for 1862 and 1863, why does the registrar make his correction by an estimate drawn from the years 1863–67 and not from 1862–67?—I cannot assign his reason, but he gives the years from 1863 to 1867 in his letter.

15,691. Why does he do that if 1862 is a recorded year?—I think he has made his calculation exclusive of the year 1862, and if you test it by calculation you will find it so.

15,692. 1867, again, seems to be a wholly abnormal year; does he include 1864?—He includes 1864.

15,693. If he includes 1864 the average is more than one to five?—For that one year; the extra vaccinations are not included in his calculation. If they were included the proportion for private vaccinations would be less than one to five.

15,694. Not only for that one year; take the year 1863, with which he starts, five times 364 is 1,820, but there



were only 1,237 public vaccinations given. The next year it is more like a half than a fifth, and the next year more than a third instead of a fifth. I do not understand why, if you are looking at the years 1863 to 1867 for the purpose of correcting your previous year, you should take a fifth?—Perhaps it will be better to let Mr. Chamberlain explain this as he was really responsible for the figures.

15,695. What is the next point arising upon the table?—Proceeding with my statement, I say in the years 1863 and 1864 an epidemic of small-pox swept across the town, and as the result of the terror caused not only by that epidemic, but by the passing of the Act of Parliament at that time to enforce the practice of vaccination more stringently, one of the Public Vaccinators, in the employ of the Board of Guardians, Dr. Lilley, performed an enormous number of vaccinations. The total number of vaccinations, and including a few re-vaccinations in these years, which were paid for by the Board of Guardians over and above the annual registered vaccinations in that year, amounted, according to Mr. Chamberlain, to 3,928. It will be seen, therefore, that, while my Diagram A. shows to a very large extent the amount of vaccination performed, it does not fully represent the entire extent to which this practice prevailed in the town, and, indeed, it would be impossible to obtain a complete return which would show it all. The later returns from 1868 show all the vaccinations performed upon children born during the year within the borough, and also those which took place during the 13 months following the close of the year, up to which time the Vaccination Officer's returns are made to the Local Government Board. Some vaccinations would undoubtedly take place after these returns were made out, and would slightly increase the amount of vaccination above that shown on my Diagram A. The clerk to the Guardians fully explained the extent of these variations to the Commission. He showed them to be very unimportant as affecting the general results. I will refer you to the one example which I have already given for 1889, as showing the variations. It will be observed that from 1849 to 1858 vaccination was almost as fully carried out as from the years 1868 to 1876. The falling off in 1859 to 1867 is more apparent than real. It simply means that the children were not vaccinated at such an early age in life, but that their vaccination was postponed till the following or subsequent years. In other words, instead of being vaccinated within the first six months or 12 months of life, larger numbers of them were vaccinated when they reached the age of one, two, or more years.

15,696. Where do you derive that fact from?—That is Mr. Chamberlain's statement to me as explaining his 3,928 extra vaccinations. This is borne out, I may observe, by the testimony given by the Guardians themselves. We are, therefore, bound to come to this conclusion, that during the small-pox epidemic of 1872 the population of Leicester was more fully vaccinated than at any preceding period of its history. Whatever protection might be claimed from vaccination, it is evident the process had gone on continuously without intermission, and that the population of Leicester had obtained by the year 1872 the maximum amount of "protection" from recent and past vaccination that any possible Act of Parliament, however stringently enforced, is ever likely to secure to any population.

15,697. Of course there seems to be ground for supposing that this does not accurately show the amount, but in 1865, 1866, and 1867 the appearances are not satisfactory, are they?—The number of vaccinations for those years were rather low.

15,698. I think there seems reason to doubt whether you have them all; for those years you say you have the actual number vaccinated by private practitioners?—Yes.

15,699. But in 1867 the number of vaccinations was considerably less than half the number of births?—I have endeavoured in reference to this to be as fair as I possibly could, and I have already explained that the number of vaccinations here returned probably does not represent the full extent of vaccination, and this would affect any argument I may bring forward afterwards.

15,699a. Merely reasoning from the diagram, and saying that prior to 1872 there was reason to suppose that the population was fully protected, that would be rather an over-statement, would it not, if any inference was to be drawn from this?—No. The vaccinations

and births are very high for each of the five years preceding and ending with 1872; so that during this quinquennial period our population was more fully "protected" than it was ever known to be before.

15,700. If you take it for the ten years previously, for the first half of that decade, the contrary is the case?—Not if you take into account the "extra vaccination" nations." If you take these into account you will find there is a higher proportion of vaccinations even than in the decade succeeding 1872.

15,701. Some of those were re vaccinations, and in the next place you do not know how far back you must spread those. We are talking of the result of vaccination before 1872, and you cannot deal with them as applicable only to the two years before?—That brings up rather a wide question in regard to the actual amount of protection claimed from vaccination. I will explain that point when I come to it later on.

15,702. (*Mr. Meadows White.*) Supposing we take the year 1867, does not that show that there were 2,000 children born in that year that were not vaccinated, and that there would be, therefore, taking that year alone, 2,000 persons of five years of age in 1872 unvaccinated?—A large number of those children would die before 1872.

15,703. You would have to correct it by that?—Yes. The number of deaths would have to be deducted from the 2,000 left unvaccinated in 1867.

15,704. (*Dr. Collins.*) I do not know whether you have happened to notice that on page 9 of the report of the Medical Officer of Health for Leicester for 1869 he states: "Annexed is a table of the mortality in every month of the year of the principal diseases and orders. On inspection of the table it will be seen that there has not been a single death from small-pox during the year; to those who recollect the ravages that it caused, and the alarm that its existence produced, this fact will appear a legitimate subject of congratulation, and I would ask those who decry vaccination to what other possible cause than it can they attribute the cessation of the disease among us? Of the reality of the blessing there cannot be a doubt?"—In the Medical Officer's judgment vaccination had been so well carried out in 1869 as to lead him prematurely to speak of the "cessation" of small-pox in Leicester.

15,705. (*Chairman.*) But we are now only investigating, as I understand, the particular table you have introduced, which is supposed to show certain facts and from which you draw certain inferences. We are not dealing with any other evidence there may be on the one side or the other for the moment; we are confining ourselves, as I understand you to be, to your table?—Yes, just for the present. Still, I presume any evidence or testimony given by the Medical Officer of Health upon that point would be important.

15,706. (*Sir James Paget.*) May we take your tables as representing the number of children born and not vaccinated previous to the year 1868?—Yes, as nearly as the number can be ascertained, but it is open to the possibility suggested by his Lordship that some children omitted in this year might be vaccinated, and, as I have already explained, may not be shown as vaccinated children in Mr. Chamberlain's figures.

15,707. (*Mr. Meadows White.*) That would apply to the children vaccinated; some of them would die?—Yes, no doubt some of them would die. Now, proceeding with my explanation of the diagram, the portions coloured black at the base of the diagram represent the total number of deaths from small-pox which have occurred in each year for the past 52 years. It will be seen that during that long period there have been seven epidemics of a more or less fatal character. The most fatal of them all was the epidemic of 1872, which occurred after nearly a quarter of a century of almost continuous and complete vaccination. The epidemic most nearly approaching in severity the one of 1872 was that of 1845, in which year 164 deaths took place from small-pox. I would also like to explain that we have included in these deaths from small-pox every death where variola is given as a secondary cause. We also include one case which is called "mixed pox," and one or two cases of chicken-pox. There are, however, not many of these cases. They do not affect the rate of mortality very seriously. The lower line, or zig-zag curve, which is drawn across the diagram represents the total deaths which have occurred from the seven principal zymotic diseases, and therefore includes

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small-pox. It is given on this diagram only for purposes of comparison with the general death-rate.

15,708. (*Chairman.*) Where do you get that figure from for zymotic deaths; is that from the Registrar-General or from the superintendent registrar?—From the Medical Officer of Health's report. I propose dealing with the zymotic deaths more fully later on, when I shall present tables and diagrams bearing on that branch of the subject. Another explanation in regard to this diagram, and indeed in regard to all the diagrams and details which I shall submit on the statistics of Leicester, is an important one. It is that of the population of the town. After I had prepared the greater part of my evidence I found that the Registrar-General had made errors of considerable importance in his calculations of the population of Leicester. On comparing his estimates with those of the Medical Officers of Health the confusion increased; for instance, in some years the Medical Officer of Health would base his calculations upon the census population; whereas the Registrar-General would base his upon the census population with a proportionate addition made for the increment of the population up to the middle of the year. There is no progressive regularity whatever either in the populations given by the Registrar-General or the local Medical Officers of Health. Under these circumstances I addressed a letter to the Registrar-General asking for the Census returns and also the total and calculated proportionate populations distributed according to age for the borough of Leicester for the years 1838 to 1889 inclusive. I stated to him the purpose for which I required this information, and said that I was preparing the statistical evidence of Leicester to lay before this Commission. In reply I received a letter, but the information was rather meagre; it is dated the 12th March 1890: "Sir,—In reply to your letter of the 10th instant asking for the estimated population of Leicester in the middle of each year 1837–89, I am directed by the Registrar-General to inform you that he has no estimates of population for Leicester so far back as 1837. The enumerated population of the borough of Leicester at the census of 1871 was 95,220, and at that of 1881, 122,376, and this latter number has been assumed to have increased annually in the ratio of 1:1·0254082. The Registrar-General has no estimate of the population at different ages.—I am, Sir, Your obedient Servant, W. OGLE, M.D., Statistical Superintendent." Seeing that certain calculations are made in regard to urban populations, I was rather surprised at this answer, because it struck me that the Registrar-General would have calculated estimates of the population at different ages, and the letter only refers me to the basis of increase for one decade. Under these circumstances I obtained the Census of England and Wales, dated 1883, volume 4, and have based my calculations upon the formulæ given here by the Registrar-General in calculating the populations, both proportional and progressive.

15,709. Starting with 1838, where do you get this population of 47,761 from?—We obtained the Census return for 1841 and also for 1831, and calculated the proportionate increase between those years, and that gives us a population of 47,761 for the year 1838.

15,710. Then every decade in this table from 1841 onwards is a Census return, is it?—It is calculated from the Census return; the inter-censal years are calculated from the preceding and subsequent census returns.

15,711. But I say that in 1841 and each succeeding decade the population is given from the Census Return?—Yes; calculated upon the basis of the Census Return.

15,712. What do you mean by "calculated upon the basis of the Census return"?—We only get the actual Census number once in 10 years.

15,713. I take it that your populations for 1841, 1851, 1861, 1871, and 1881 are the actual Census returns?—Yes; with the calculated addition for the three months of the year. The Census return is generally taken in March, and then the Registrar-General makes a calculation as to the number on June 30th, the middle of the year. We have taken the number the Registrar-General himself takes for the middle of the year.

15,714. You have taken the Registrar-General's number?—Yes; I took the Registrar-General's number for the Census years.

15,715. Then between those dates, 1841 and 1851 you have calculated the increase, and you have supposed

that to have averaged itself over the intervening period?—Yes; though not exactly an average, but a regular and progressive increase throughout. In some of these inter-censal years there is a very great discrepancy in the tables; the greatest difference is observable in the decade from 1871 to 1881.

15,716. Discrepancy between what?—Between the figures that I have calculated and those which are given by the Medical Officer of Health and also by the Registrar-General. For instance, to take the year 1877, the Registrar-General and the Medical Officer of Health give our population at 117,461, but they afterwards found when the census was taken in 1881 that this was much too high. In that year, 1877, they were 6,107 above the number which should have been returned. The principal differences occur in the years which I will name. In the year 1862 the numbers taken were 2,189 below the number that should have been returned; in 1864 they were 2,415 above the number that should have been returned; in 1868 they were 3,163 above the number that should have been returned; in 1877 they were 6,107 above the number which should have been returned, and in 1878 they were 5,663 above the number that should have been returned. I just point this out to show after I had made a very large number of calculations I found that no very accurate calculations could be based upon such returns, and of course had to make the calculations over again. From 1881 I have taken the Registrar-General's figures, although they disagree slightly with my own calculations, but the difference is very slight; the highest difference is in the year 1888, when I make it 78 more than he makes it; so that we take his figures for all the years of this last decade though slightly below ours owing to the circumstance of not having the 1891 Census returns. But for the other years the Registrar-General, not having had the Census returns, has, of course, based it upon an assumed increase which has not always been realised. The Commission will see from this that it was impossible for me to accept any existing result without a re-calculation. It, therefore, became necessary for me not only to correct the whole tables of populations from 1838 up to 1890, but it became necessary to re-calculate the ratio of the respective increase of the population for inter-censal years. Unfortunately, these also involved re-calculation of nearly the whole of the results at which I had arrived, because of the enormous discrepancies which I found to exist between the actual and the assumed populations. From 1881 the results I arrived at were practically the same as those which have been published by the Registrar-General, the difference being so minute that I have been glad to adopt his figures whenever I found them available, but this applies only to the census years and the inter-censal years of the present decade. I have also calculated the proportional populations upon the approximate rates for different life ages as given by the Registrar-General in volume 4, General Report, Census of England and Wales, 1881. I hope this explanation of my Diagram A., and the basis which I have adopted for the whole statistical evidence, will satisfy the Commission that I have taken the utmost pains, and been at a considerable amount of trouble and expense, to present as nearly as possible the exact facts on this complicated subject. I have only a few more words to add in reference to Diagram A. It represents both of the larger charts now hanging on the wall. It was almost impracticable to produce both of them on a single chart on this larger scale, but it was necessary to prepare these larger charts because it is almost impossible upon smaller diagrams and charts to show our small-pox, especially for the later years. I propose using the whole of the figures as now explained, and they have been compiled from the sources already named. I have introduced one feature into the subject which is probably somewhat new, that is, the marriage-rate, which I shall deal with later on. In dealing with the small-pox mortality for the past 52 years, in addition to the annual divisions shown on Diagram A., I have divided the period into quinquennials commencing with the year 1838. These dark lines which run up Diagram A. show the five-year periods. The advantage of this division is that it commences with the first year, and gives us a run of about 15 years, or three quinquennial periods of optional or encouraged vaccination. It also gives us about 15 years of obligatory vaccination if we include the year 1853, which is unimportant as regards mortality. The exact divisions are almost identical with the passing of the Compulsory Act in 1853, and the passing of the Penal Act in 1867. We then have



two or three quinquennials of penal vaccination before the practice began to be abandoned to any considerable extent by the population of Leicester. It is true the terrors of the law prevented any serious decrease in the total number of vaccinations until 1878, but it will be observed that the birth-rate up to about this time was increasing, and the difference between the total number of vaccinations and the total number of births was expanding. In the latter part of the quinquennial period, 1878 to 1882, the falling off becomes still more remarkable, and in the last entire quinquennium with which we deal, from 1883 to 1887, the falling off is enormous, and in the last few years there are scarcely any vaccinations at all. In Leicester the period of highest mortality from small-pox is the period of highest enforcement of vaccination. The epidemic which began at the latter end of 1871 and terminated at the beginning of 1873 (when the town was assumed to be efficiently protected by vaccination) was so fatal that more deaths from small-pox actually took place in the year 1872 than for the whole of the preceding 22 years. This period of 22 years also includes all the deaths of three epidemics of small-pox in addition to those occurring at the end of one epidemic and the beginning of another. It will be noticed that each quinquennial period contains an epidemic of small-pox with almost unexceptional regularity; the one exception to this rule being 1853 to 1857, which only contains the tail end of one epidemic and the beginning of another. This will account for the low small-pox mortality for this quinquennium.

15,717. From 1873 to 1877 is less than the quinquennium you have just mentioned?—I am referring to a period prior to the epidemic of 1872. Low as is this mortality for 1853–7, it considerably exceeds the mortality of each period since the subsidence of the great epidemic of 1872. I notice that some of the witnesses who have appeared before the Commission have made the main dividing line between the years 1871 and 1872; but in the case of Leicester it would be manifestly unfair to make such a distinction, as the diagram itself fully proves, coupled with the returns presented by the Guardians and given in Mr. Chamberlain's Table B. The enormous rise in infantile vaccinations in 1868 also definitely fixes the dividing line between the years 1867 and 1868. I think it would be absolutely unfair to make such a division between 1871 and 1872 for Leicester, and I have, therefore, based my calculations upon the divisions which I have already described and which are shown on Diagram A.

15,718. (Mr. Meadows White.) Did the epidemic begin in 1871?—It did; it began late in the year, in the autumn; there were 12 deaths in 1871. The fact of an epidemic existing in the country generally at that time induced the Local Board of Leicester in 1871 to commence the erection of the hospital to which I have already alluded before any actual cases of small-pox had occurred. Before the hospital was finished the epidemic broke out in the town, and the cases were sent to a small hospital in the borough, which accounts for the two H's his Lordship observed in the Registrar-General's return. There used to be a small hospital within the town which is now abolished.

15,719. (Chairman.) Is there any record of how far in 1872 the deaths were deaths from imported cases of small-pox, that is to say, people who had come into the town bringing it, just as in recent years the whole of the recent cases appear to have been cases of persons coming into the town and bringing small-pox with them? No similar record, I suppose, was obtained for the earlier years; it is only since this isolation system has been brought into play that such a close record has been kept?—That is so; there being no reliable information for the earlier years. In fact the record book of the hospital for the year 1872 is missing altogether, and we cannot tell from this source which of the patients died; the deaths of about 32 people occurred in the hospital in that year and the remainder of the small-pox deaths for 1872 took place in the town; the figures could be got, no doubt, from the books of the Blaby Union.

15,720. Will you now continue your statement?—The diagram and table I have just described show absolute numbers, and I will now proceed to elaborate them with diagrams and tables of rates. I here put in Table 5, which gives the annual death-rate from small-pox per million total population from 1838 to 1889. (See Appendix III., Table 5; page 434.)

15,721. The small-pox death rate per million living: how have you arrived at that; take the year 1838, for

example?—We have arrived at it by the ordinary method of calculation.

15,722. That would be 230 deaths per million living?—Yes, assuming a million persons were living in Leicester in that year, 230 of them would have died from small-pox. I also put in Table 6, which gives the annual vaccinations per 5,000 births from 1849 to 1889. (See Appendix III., Table 6; page 434.)

15,723. Where do you get those figures from?—By calculation, that is assuming that 5,000 births took place in each year through the whole period.

15,724. (Mr. Meadows White.) That is rate?—Yes, a rate.

15,725. (Chairman.) You take the rate in each year as compared with the actual number of births?—Yes, taking the actual number of births and the actual number of vaccinations and the proportion they bear to one another, and then, assuming that there were 5,000 births in each year, we find by calculation how many vaccinations would have taken place.

15,726. (Sir Charles Dalrymple.) With regard to these tables, the basis of population, I suppose those numbers are the same numbers as you have in Diagram A. ?—Yes, Diagram A. is a diagram of absolute numbers, and is practically the basis of the whole of the figures and calculations I now proceed to put in. I also hand in Table 7, which shows the annual vaccinations and births per 100,000 population from 1849 to 1889, inclusive. (See Appendix III., Table 7; page 434.)

15,727. (Chairman.) Of course, whatever criticism your Diagram A. is subjected to as showing the proportion of vaccinations to births would affect this table?—Yes, in proportion to the validity of the criticism it would affect this table; at the same time I think I have clearly explained that the absolute table shows rather the minimum of vaccination and not the maximum.

15,728. But if there is any point in a particular year the variations may become important?—My reason for giving the vaccinations in the two different methods of calculation is to show that whether we take them upon a birth rate or a population rate they are practically alike and run on parallel lines. Both these rates are freely used in the diagrams which I am about to lay before the Commission. In annual rates of vaccination, as I have already explained, we are unable to use the additional vaccinations referred to in the footnotes of Diagram A. and Table 6, because these annual vaccinations are for the most part the vaccinations of births for the year; but in the quinquennial diagrams we are able to use them on account of the wider sweep of time covered. It should, therefore, be borne in mind that the seeming fall in vaccinations from 1858 to 1867 is more apparent than real, on account of the large number of extra vaccinations performed in 1863 and 1864, mostly of young children. I will now put in Diagram B. (The diagram was handed in. See Appendix III., Diagram B.; facing page 434.) This illustrates Tables 5, 6, and 7. This diagram shows, firstly, an enormous rise in small-pox mortality after a quarter of a century of continuous vaccination up to 1872, which period ends with five years penal enforcement of vaccination and the highest small-pox epidemic known in Leicester for more than 50 years; secondly, that from 1872 a rapid decline in vaccination is observable, and is coincident with our lowest known rate of small-pox mortality and with the introduction of the Leicester treatment of this disease; thirdly, that with the abandonment of vaccination and the perfecting of the "Leicester method" of sanitation, isolation, quarantine, disinfection, &c. during the last six years small-pox mortality becomes extinct.

15,729. Have you gone into the question at all as to whether there has been a similar extinction of small-pox mortality in places in which your system of isolation and quarantine has not been adopted?—I have not yet investigated that matter particularly, but of course I am aware that there are towns where there has been little or no small-pox mortality.

15,730. Would not an inquiry of that sort be essential to enable one to judge how far the particular result was due to the suggested cause?—The only inference I could deduce from a comparison of that kind would be this, that if a town which had practised vaccination had been found to be free from small-pox, and a town which had left off vaccinating was equally free, then nothing could be claimed for vaccination.

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15,731. That is a different point. What I was asking you about was the virtue of your system of isolation and quarantine which you suggest seems to be indicated by this absence of mortality?—I shall show afterwards that our Leicester system has been very effective in dealing with importations of small-pox into the town.

15,732. That is another ground; that is evidence of another kind. We are merely dealing with the evidence afforded by the table at the moment. In order to ascertain how far the evidence afforded by the table was at all conclusive it would be necessary, would it not, to compare that with other places where a similar system had not been in operation?—It would be advantageous to make that comparison, no doubt.

15,733. (*Dr. Collins.*) Have you made that comparison in the case of Sheffield?—Yes, I have made that comparison with several towns, Sheffield and some others, but the comparisons will be given later on.

15,734. (*Mr. Bright.*) Your contention is that whatever the virtue of vaccination in preventing small-pox this good system of sanitation has just as much virtue?—My contention is that it has far more, and that in fact vaccination has none, because we have dealt with small-pox without vaccination.

15,735. (*Chairman.*) This would be an important consideration too, would it not, whether there had been since 1872 any similar general epidemic condition of small-pox, such as existed in the year 1872; would this not be an element one would have to take into account?—It would be an element to be taken into account, if it could be correctly ascertained.

15,736. Of course, the value and importance of it would be another thing; but supposing you had an epidemic condition which affected the country generally in a particular year you would have to take that fact into account both in considering such statistics as these and in comparing town with town?—We should have to take that into account to a certain extent.

15,737. (*Mr. Meadows White.*) Has there been anything like the epidemic of 1872 since 1872 in the country?—I believe not, judging alone from the actual mortality; but there have been isolated epidemics. Referring to Sheffield once again, I might say that there is a constant communication between Sheffield and Leicester. There are some 40 trains a day running through from one town to the other, so that there was constant intercommunication at the time the epidemic was raging at Sheffield, and, as a matter of fact, we had a large number of importations from Sheffield. So that probably we had the epidemic conditions of 1872, but their fatal development was prevented by the effective application of the "Leicester method."

(*Mr. Meadows White.*) We are badly off in London in that respect because we have trains from every part of the country.

15,738. (*Dr. Collins.*) Can you tell me whether the epidemic of 1872 began in separate centres, and did not storm the town, as a whole, within a short time?—It began in isolated cases.

15,739. Which were dealt with under the system of isolation to a certain extent, but it was subsequently found that the provision for isolation was insufficient, was that so?—The epidemic was of such a character that the provision which had been made was found insufficient and even when a special hospital was erected.

15,740. Did the epidemic spread from those centres?—Yes, it spread from the earlier cases.

15,741. (*Chairman.*) What is the next point you have to bring before us?—It will, no doubt, be admitted that the earlier years of the period dealt with are known to have been very fatal in zymotic diseases, and that they might therefore reasonably be expected to be more fatal in small-pox than the later years. Thus we find that the small-pox death-rate, which was 1,121 per million in 1840, rose to 2,994 in 1845.

15,742. Where are those figures taken from?—You will find those figures in Table 5; they are also shown by Diagram A. In 1849, when vaccination was becoming more fully practised, the small-pox death-rate per million was 1,124, slightly higher than in 1840. In 1851 it declined to 33 per million, but again rose to 846 per million in 1852, and after an absence of two years, in 1854 and 1855, small-pox once more returned in 1856, and in 1858 the mortality was 804 per million. Meanwhile vaccination had been continuously carried out, but in 1864 the death-rate from small-pox was higher than

in any preceding year (excepting 1845), reaching 1,370 per million. It was, however, reserved for 1872 to overtop the highest mortality previous to this date. In this year, 346 deaths from small-pox occurred. I may explain that the 346 include 32 which occurred at the hospital outside the borough. This was a greater number of deaths from small-pox than had been registered altogether for more than 20 years preceding 1872, which period included three epidemics. The small-pox death-rate for 1872, when the town was more thoroughly vaccinated than at any previous period of its history, reached the unprecedented height of 3,523 per million. Since the decline of that epidemic the town has been visited by small-pox in 11 of the 16 years which have elapsed; but in none of those 11 years did it spread to any large extent owing to the vigorous sanitary measures applied, nor has it at any time since the introduction of these measures proved to be either dangerous or very fatal.

15,743. What was the date of the introduction of these measures?—They were in full operation under Dr. Johnston, who was the Medical Officer of Health, in 1877 and 1878; the highest death-rates per million since their general adoption being only 54 in 1877, and 40 in 1882.

15,744. You had had three consecutive years without any deaths before that system was introduced?—Yes, we had, the existing susceptible material having, notwithstanding vaccination, been burnt up by the epidemic.

15,745. (*Dr. Collins.*) Was not the hospital in use? You had had a hospital before that, had you not?—Yes, we had a small fever house, as it was called, inside the borough. But it is obvious that the system could not be tested until the occurrence of small-pox cases. When these were introduced the efficiency of our "Leicester method" was fully established. Now, in addition to the divisions already alluded to, I have divided Diagram B. into vaccinal periods, as follows: Vaccination optional (in Leicester), 1838–42; State-encouraged vaccination, 1843–53; vaccination obligatory, 1854–67; vaccination penally enforced, 1868–76; vaccination rapidly declining and introduction of what is known as the "Leicester method" of treating small-pox, 1877–83; and vaccination abandoned, 1884–89. These notes will be found at the bottom of the diagram. So few vaccinations had taken place during these later years that I think we are fully justified in using the term "practically abandoned." During these later periods vaccination has gone on declining until it has almost vanished; while in spite of frequent importations of small-pox there have been no deaths from this disease since August 6th, 1883, now a period of nearly eight years, to 1891.

15,746. (*Sir Edwin Galsworthy.*) You could hardly say that it had been abandoned since 1884 according to your diagram?—I think we can. If you look at the proportions shown on Diagram B. you will see that the vaccinations had dropped very low indeed.

15,747. They did not drop very materially until 1886?—If you take the year 1871, when vaccination was highest, you will find a considerable drop even up to 1876. Of course, based upon a rate, as it is on Diagram B., you can see the fall better than you can on Diagram A. Then the fall from 1876 to 1883 is enormous, being a drop of about 47 per cent., and even from 1882 to 1883 there is a considerable fall, which has been subsequently accelerated, so that I think we are fully justified in saying that from 1884 vaccination has been practically abandoned.

15,748. (*Dr. Collins.*) I notice that you give the year 1867 as the dividing line between two of your periods. Dr. Ogle, in answer to Question 453 in his evidence before us, said: "The year 1868 was the year in which 'they were allowed to appoint Vaccination Officers, but it was the compulsory appointment of Vaccination Officers which was the matter of importance.' Apparently that would hardly be a correct representation of the case as regards Leicester?—Not at all as regards Leicester, because they appointed a Vaccination Officer immediately after the Act of 1867 came into force, and the great rise in the number of vaccinations shown upon Diagram A. shows the result of his appointment, and justifies the division I have taken between 1867 and 1868.

15,749. And did the 1871 Act have any effect upon the proportion of vaccination to births?—Not any effect at all; there is really a decline from that year; vaccina-



tion reached its height in 1871, the year prior to the epidemic, and declines even in the epidemic year of 1872.

15,750. (*Mr. Bright.*) You mentioned a number of imported cases of vaccination; have you a diagram to show that?—I have a diagram; we shall come to it later on; I shall show the effect of the Leicester importations of disease by this special diagram. I should like to observe that in the reports of the Medical Officers of Health there is generally a short paragraph in each of their reports dealing with small-pox occurring in Leicester, and in some years they allude to the sedulous manner in which vaccination has been carried out. These observations occur before 1867, justifying, I think, my contention that vaccination was well carried out before that year, and I notice that in two instances at least they state that the absence of small-pox from Leicester is owing to the successful manner in which vaccinations have been carried out. These statements have followed immediately after every epidemic of considerable severity. A year or two before the epidemic of 1872, in 1869 and 1870, Dr. Crane, who was then the Medical Officer of Health, refers to the effect of vaccination as somewhat remarkable; at page 9 of the Medical Officer's report for 1869 he says: "Annexed is a table of the mortality in every month of the year of the principal diseases and orders. On inspection of the table it will be seen that there has not been a single death from small-pox during the year; to those who recollect the ravages that it caused, and the alarm that its existence produced, this fact will appear a legitimate subject of congratulation, and I would ask those who decry vaccination to what other possible cause than it they can attribute the cessation of the disease among us? Of the reality of the blessing there cannot be a doubt. And on what grounds are we advised to discontinue a practice the results of which have been so strikingly advantageous? This is not the place to discuss the question, but I feel bound to express my opinion, from all I have myself observed and read on the subject, that the fears of the objectors are entirely groundless, and that the arguments which they bring forward to support their views are entirely groundless and fallacious with reference to this country." Those observations were made in 1869. Then in 1870 he has a very long article upon small-pox and vaccination which is too long to read, but Dr. Crane refers to the publication of a pamphlet or document by the Royal College of Physicians of London dated February 7th, 1871, and then at page 13 of his report for 1870 he goes on to remark: "Returning to ourselves in Leicester, I have again the satisfaction of stating that not a single death from small-pox has been recorded during the last year, but you are aware that it prevails most extensively in London, Liverpool, and other large towns. We can scarcely hope, therefore, that our

"immunity from its presence will be of very long duration, the intercourse between these towns and Leicester being so great. But I am happy to be able to say that vaccination has been sedulously attended to; and it is scarcely necessary to impress upon parents the vital importance of continuing the good work without relaxation. It is a subject of great regret to find that there are still individuals who are blind to its necessity, and fearful of pernicious results from its adoption. I may, therefore, repeat that, so far as my own experience goes, I can state that I never saw such effects." Thus we see that the unbounded confidence of Dr. Crane in 1869 subsequently gave place to well-grounded fears as the epidemic approached notwithstanding his expressed satisfaction at the efficiency of our vaccination.

15,751. (*Mr. Picton.*) That was the report of 1871, was it not?—No, it is the report for 1870 at page 13.

15,752. But then he quotes a document dated February 7th, 1871?—Yes, because his report for 1870 would be written probably towards the middle of the year 1871. The report from which I am now quoting is for 1870, but he would not begin to write it until after February 1871.

15,753. The point is that he wrote these words just before the great epidemic?—Yes, just before the epidemic began. It is rather important at this point to give a quotation from the reports of two other years. At page 4 of the report for 1871 he says: "It may be recollected that at the period of the publication of my last report I had the gratification of announcing that during the year 1870 there had not been a single death from small-pox in Leicester, although it was prevailing to a great extent in London, Liverpool, and other towns, and I ventured to anticipate that we could scarcely hope to escape a visitation very long, and in effect, at the latter end of April, three cases occurred, one of which terminated fatally on the 5th of May. Steps had previously been taken by the Board of Health for the establishment of a hospital for the isolation of future cases, into the history of which I need not enter as it is familiar to you all. I may say the means adopted were almost completely successful in checking the progress of the disease, and from the 6th May to the 31st December only 12 deaths occurred in the town, and I am of opinion that we could, by the efforts which were used, have completely stamped out the disease, but for the opposition which was manifested in certain quarters to the removal of patients to the hospital. At the period of writing this" (this would be in 1872, when writing the report for 1871) "I regret to say that the disease is so extensively disseminated that I fear the utmost that we can accomplish will be to moderate the severity of the epidemic; and this, I trust, we shall be able to effect very considerably."

*Mr.  
J. T. Biggs.*  
29 Apr. 1891.

Adjourned till Wednesday next at 1 o'clock.



## Sixty-fourth Day.

Wednesday, 6th May 1891.

PRESENT :

The Right Hon. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
 Sir CHARLES DALRYMPLE, Bart., M.P.  
 Sir EDWIN HENRY GALSWORTHY.  
 Sir WILLIAM SAVORY, Bart.  
 Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
 Mr. J. ALLANSON PICTON, M.P.  
 Mr. SAMUEL WHITBREAD, M.P.  
 Mr. F. MEADOWS WHITE, Q.C.  
 Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary*.

Mr. L. P.  
 Chamberlain.

Mr. LIONEL PERCY CHAMBERLAIN recalled and examined.

6 May 1891.

15,754. (*Chairman*.) On the last occasion Mr. Biggs handed in a diagram and some tables showing, amongst other things, the vaccinations which had taken place in Leicester during a number of years between 1844 and the present time, and he informed the Commission that he had received the materials for his tables and diagram from you?—Yes, that was so.

15,755. The Commission desire to understand exactly (which they were not able clearly to gather on the last occasion) what are the materials which you had for those figures; how far they represent actual records, and how far they are estimates. Now to begin with take the two years 1844 and 1845, when the public vaccinations are stated to be 551 and 1,089, there being no record of private vaccinations; where were those figures derived from?—I start in my tables at the year 1849; I may have furnished Mr. Biggs with the figures for the years 1844 and 1845; if so they would be taken from the filed returns sent to the Poor Law Board at that time.

15,756. Commencing then from 1849, the public vaccinations are stated to be 1,549; where is that figure derived from?—From the copy of a return in the possession of the Guardians, filed in their offices, which was sent to the Poor Law Board.

15,757. Made up by whom?—By the clerk for the division.

15,758. Where does he get the figures to make up the 1,549?—That was a copy of the return furnished to the Poor Law Board for 1849, showing the number of public vaccinations for the year ending 29th September.

15,759. By whom was that return furnished?—By the medical officers, each one separately.

15,760. Where would they get the materials to make up that return?—Each medical officer would keep the register of public vaccinations then, I presume, as they do now.

15,761. Would that include all the public vaccinations in 1849 down to the 30th September in that year?—Yes.

15,762. Whether primary or re-vaccinations?—Yes; but I do not think there would be many re-vaccinations judging from subsequent years.

15,763. But would it not include all?—I think it would not include the re-vaccinations so far as I can judge from the returns, which I have gone carefully through this week, because 1871 was the first year when a column was set apart for re-vaccinations.

15,764. Would that not seem to indicate that before that year they made no distinction whether they were primary or re-vaccinations?—I think not, because that was the first year when the re-vaccinations were set apart, when the number of re-vaccinations was 390 and of primary public vaccinations 1,983; in the previous year 1870 the total number returned was 1,973, so that it looks as if they were not included up to that time. Both of these numbers were for the years ending with September 29th and not December.

15,765. You have drawn that inference from the figures, but why should a Public Vaccinator make any distinction between vaccinations and re-vaccinations—he would not as regards his charge, would he?—Yes; there was a difference in the charge.

15,766. Do you suggest that there was no record prior of the re-vaccinations prior to 1871; the Public Vaccinator would keep a record, surely?—I cannot say that.

15,767. (*Dr. Collins*.) Were re-vaccinations paid for prior to the year 1871?—That I cannot say now, but I believe not. I think 1868 was the first year in which re-vaccinations were paid for, but not in the prior years.

15,768. (*Chairman*.) I see there were regulations relative to vaccination as early as 1859, which prescribed that in the register of cases the person performing the vaccination should write in the register the letter R against any case of re-vaccination; do you know whether that regulation was carried out?—I cannot say.

15,769. Would the 1,549, which is returned as the total number of public vaccinations for 1849 on your Table A., refer only to persons born in that year, or would it include all vaccinations, whether of those born or not born that year?—It would include some not born that year, I should judge.

15,770. It would include all vaccinated, though some were not born in that year?—I should judge that.

15,771. (*Mr. Picton*.) That is only an inference; you do not know that?—No; but I have looked at one of the registers in the Leicester district beginning at 1854, and looking at the dates of the vaccinations I can tell that some of the children were vaccinated over a year old.

15,772. Is it not the case now that the returns for the vaccination of children born in each year have to be given; that is to say, they have to send up to the Local Government Board the number of children born in 1890, and also the number of children vaccinated; those are kept separately, are they not?—Yes.

15,773. When did that system begin?—In 1872 or 1873, I think.

15,774. Previously the accounts were kept differently?—Previously the returns were made by the medical officer of the number he had vaccinated.

15,775. (*Chairman*.) So that previously it meant the number of vaccinations in the year, without reference to whether the children vaccinated were born in that year or not?—So I take it.

15,776. Now how do you arrive at the 310 private vaccinations in that year 1849?—They are estimates merely.

15,777. How is that estimate made?—From 1849 to the end of 1861 we have no register for one district; we have for the others.

15,778. You have no register of private vaccinations?—We have no complete register of vaccinations at all



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for one district; we have the total number but not the name of every child, date of birth, and such particulars.

15,779. But you have the total even when you have not those particulars?—We have. Then I take the number from 1862 up to and including 1867 of public and private vaccinations, and I have taken them roughly as one to five.

15,780. Because the average from 1862 to 1867 was one to five; you give that as the supposed number previously?—Yes, but that that would be under the mark, I take it.

15,781. Now take it from 1862 to 1867—have you worked it out, is it one to five, if you add up all between 1862 and 1867—have you added them up?—Yes, I did it at the time.

15,782. That period from 1862 to 1867 includes two years which are very remarkable; if you exclude the years 1862 and 1867 the proportion in 1863, 1864, 1865, and 1866, if you take those four years, would be very different from one to five?—Very.

15,783. It only comes to be one in five by reason of the extra small numbers in 1862 and 1867?—Yes.

15,784. Take 1867, does not it occur to you that there must be some mistake in 1867 in putting private vaccinations down as only 18; you see in the previous years it was 364, 729, 339, and 281; in the subsequent years there were 1,448, 697, 965, 972, and 960; it is almost inconceivable that in the year 1867 there were only 18 cases of persons vaccinated by private practitioners, is not that so?—I have looked at it myself, and I have spent hours in trying to account for it but the figures in the register show it, and I cannot account for it.

15,785. How are those vaccinations by private practitioners returned?—They are registered in the same way as the public vaccinations.

15,786. But if the person whose duty it was to register omitted to enter a number of them, though he had received them, that would account for it, would it not?—But that could not be, I think.

15,787. Why?—Because the registers are so carefully inspected by the Local Government Board every year, and he would have been called to account if they found any serious omissions.

15,788. But they would not know that there was any serious omission any more than yourself; you admit there is something which strikes you as strange about his only registering 18 in that year?—But the number is included in the same register as the public vaccination—it is one whole register, and it does not show that there is any serious omission to register vaccinations.

15,789. But what would show it?—The column would be left blank.

15,790. If he had registered 18, though he might have received information as to a number more, that would not show it?—The vaccination register is a copy of the register of births, and there are extra columns for putting in the date of vaccinations.

15,791. I am supposing he has omitted to put in the dates of vaccination against those of the births of children who had been vaccinated by private practitioners?—Then I say the inspector of the Local Government Board would have noticed it at once.

15,792. In the previous year the number vaccinated by the Public Vaccinator was within 70 or 80 of the number vaccinated by the Public Vaccinator in this year, 1867; whereas the number vaccinated by private practitioners had fallen from 281 to 18, although the number of births had not fallen, so that there must have been an obvious deficiency in the number vaccinated which must have escaped the notice of the inspector of the Local Government Board?—But you will notice that in 1868 they jump up from 18 to 1,448.

15,793. But there must have been a large number of re-vaccinations, must there not? It seems a very extraordinary thing when one knows the large number of persons in whose families the vaccination is done by private practitioners that it should have jumped from 18 in 1867 to 1,448 in 1868?—I can only account for it by suggesting that there was some cause for postponing the operation amongst the better class of people.

15,794. (Dr. Collins.) May it not have been that the Act of 1867 operated in the direction of urging parents who had had their children privately vaccinated to send in their certificates?—It may have been so.

15,795. (Chairman.) Finding these extraordinary years of 30 and 18, two years out of your six, which are so very different from the surrounding and subsequent years, the figures suggest, do they not, that it is not a very safe thing to take the average which results from taking into account those two very abnormal years? It may be the best you can do, but they suggest that it is not an absolutely safe guide?—No, it would only affect the private vaccinations; it does not affect the question of the total vaccinations of the whole population.

15,796. Yes it does affect it, because the total is made up by adding the public to the private vaccinations, and if you make the private vaccinations too many or too few it affects the total?—That is so. But the registers give definite figures, and I have adhered to them.

15,797. (Mr. Bright.) Is it not the case that if those were all entered in the register it might possibly be that the clerk who was entering them had ticked them off in the column for public vaccinations, whereas he ought to have put them into the column for private vaccinations; the number might be all right, but they might be in the wrong column?—No, I do not think so, because against private vaccinations there would be the name of the private vaccinator.

15,798. But the clerk might not know whether he was a private vaccinator?—He would know the Public Vaccinator.

15,799. (Mr. Picton.) You have the register books for that period from 1862 to 1867 in your office, have you not?—Yes.

15,800. The vaccination registers?—Yes.

15,801. With the name of every child born in those years?—Yes.

15,802. In each case against the name it gives the date of the vaccination?—Yes, and says who it was performed by.

15,803. And in going through those columns you would see for the year what names remained vacant?—Yes.

15,804. Are there many?—I went through some yesterday, and out of a book of 500 entries the average filled up was 335; the remainder were blank; some were marked "dead," "removed," and such remarks.

15,805. But they were accounted for?—Yes, they were mostly accounted for.

15,806. Then all those which are marked vaccinated must have been vaccinated in some way or other, publicly or privately?—Yes.

15,807. Would it be possible that there was an error in putting down as public vaccinations those who had been privately vaccinated?—I think not.

15,808. (Chairman.) There was one year in which it was suggested that there had been a number of re-vaccinations; there was a curious calculation upon the document Mr. Biggs showed me which he said you had prepared for him?—In 1863-64 there were 3,928 extra vaccinations.

15,809. Why do you treat those as additional vaccinations and re-vaccinations?—If you look at the year 1864, the total vaccinations in the third column are shown as 1,925 on my Table A.; that is the actual number counted up from the vaccination register, but in the medical officer's return to the Local Government Board there were 5,000 and odd persons vaccinated in that year.

15,810. Then those are vaccinations which had not been entered in the vaccination register?—The majority would no doubt be deferred vaccinations at the time, owing to the epidemic.

15,811. Would none of those be by the Public Vaccinator?—They were all returned by the Public Vaccinator.

15,812. Would they not be entered in any register of his?—No; not at that time; anyone who presented himself for vaccination in those years was vaccinated.

15,813. He would not certify them with any he had previously neglected?—No.

15,814. (Mr. Picton.) Was not this record intended to show how far the law had been complied with?—Yes.

15,815. They entered only here those vaccinations which were in compliance with the law?—Yes.

15,816. There was no compulsion for re-vaccination, but there was for primary vaccination?—Yes.

15,817. The object of this register was to show how far the law had been carried out?—Yes.



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15,818. Then it would be confined to primary vaccination?—Yes.

15,819. (*Chairman.*) As I understand, there would be many vaccinations of children two or three years old, as to which the Vaccination Officer would not go back to the register, but he would merely return them as vaccinations?—He would go back for two or three years, but not more than two or three years; he does not count those who were seven or eight years old if they had come from country districts, and in those cases where they have no local register of birth; they are entered in the end, but they are not entered in these returns for Leicester because notice would be sent to the registrar of the district in which they were born.

15,820. (*Mr. Picton.*) Then these registers do not represent all the vaccinations that took place in Leicester during those years—the vaccinations would be far more numerous?—There would be other vaccinations of children who were born away out of the district.

15,821. (*Chairman.*) Would not the vaccination of a child born out of Leicester, if it came within the year to Leicester be recorded here?—No; notice would be sent to the registrar of the district where it was born, to be recorded in his entries.

15,822. (*Dr. Collins.*) It is only where the registrar returns both the birth and the vaccination that he receives the fee?—Yes.

15,823. (*Sir James Paget.*) Was 1863–64 the only year in which these extra vaccinations occurred?—I think in 1871 there were 1,983 put down as primary vaccinations, and there are 390 not included in those figures as re-vaccinations.

15,824. But in comparison with the 3,900 that was a very small number. I notice that in the year 1863–64 there were 3,928 extra vaccinations performed?—Yes.

15,825. Were there no extra vaccinations performed in any other year?—Taking the total of 3,736 for 1871, there were 390 vaccinations which were not included in this number.

15,826. (*Chairman.*) In 1864 there were a number of extra vaccinations which did not go into the register because they were of children born some time before—did not that occur at all in 1871?—No, in the year 1871 that is the number vaccinated out of the births.

15,827. And there was not a single one vaccinated that did not properly come into the register of the year?—No.

15,828. That seems rather strange, does it not?—They were not all vaccinated in that year, but the registers have been completed, and now show that out of the children born in that year 3,736 have been vaccinated.

15,829. Supposing in 1871 there was a number of children vaccinated who had been left unvaccinated in the previous year, would those be put back to the previous year?—Yes, they would.

15,830. That you say being the principle before the years 1869 and 1870, there might be children amongst the vaccinations of 1868 who were really not vaccinated until 1871—might that be so?—Yes, that might be so.

15,831. When did that system of correcting the registers, as I may call it, so as to put into them all vaccinations of children born in the year, begin?—I believe in 1868.

15,832. So that prior to 1868 the vaccinations, speaking generally, would be vaccinations which took place whenever they were vaccinated without regard to when they were born; after 1868 they would be the vaccinations of children born in the year though they might be vaccinated in a subsequent year?—The register which I examined yesterday went back to 1853 and 1854 to account for the number in each year.

15,833. You mean that they had been filled up afterwards when the child was vaccinated afterwards?—Yes, speaking generally, if the child were vaccinated within a couple of months.

15,834. As a rule in all those earlier years the number represents the children vaccinated in that year?—Yes.

15,835. After year 1868, take for example the years 1869 and 1870, there may have been a number entered under the head of 1870 or 1869 who were not vaccinated in fact till 1871, the time of the epidemic?—That might be so.

15,836. (*Mr. Meadows White.*) Do you happen to have with you any form of register?—No, I have not.

15,837. Do the forms which would admit the entries of vaccinations occur upon the same leaf as the registration of the birth?—Yes; the outer column was kept for that purpose.

15,838. It was the duty in those times, and I believe it is so still, for a person who had the charge of the child or who was responsible for its vaccination, to bring a certificate of its successful vaccination to the registrar?—Yes.

15,839. From that certificate he would make up the register?—Yes.

15,840. It would be the duty of the registrar to enter that in the column against the birth of the child whose vaccination it was?—Yes.

15,841. (*Chairman.*) Are those books very bulky?—Not individually.

15,842. (*Mr. Bright.*) With reference to those 18 private vaccinations in the year 1867, there must of course in that year have been the usual proportion of births amongst the higher class of people of Leicester?—Yes.

15,843. And unless there are great gaps in the vaccination column of the register those children must have been entered as publicly vaccinated; is not that so; otherwise if they were not entered as publicly vaccinated the spaces must have been left blank?—Yes.

15,844. And that would have been very visible?—Yes.

15,845. Those people you would expect to have had their children vaccinated privately?—Yes.

15,846. Would it not be possible to refer to some of the families of Leicester to ascertain whether their children are rightly entered as having been publicly vaccinated?—Yes, it would.

15,847. Then you would see whether that mistake which I suggested might be made had really been made?—Yes.

15,848. (*Chairman.*) I think if you will let the Commission have the books for the years 1861 and 1862—?—For 1861 I have only the book for one district.

15,849. Very well, we understand that; will you let us have the books for 1861, 1862, 1867, 1868, 1869, 1870, 1871, and 1872?—Yes.

15,850. (*Mr. Picton.*) Have you ever known medical men attending families who would recommend that the children should be vaccinated by a Public Vaccinator?—No, not within my knowledge.

15,851. (*Dr. Collins.*) Is the date of the vaccination when certified entered in the column opposite that in which the birth is recorded?—Yes.

15,852. So that you would be able to tell how long an interval had elapsed between the birth and the entry of a successful vaccination?—Yes.

15,853. Can you give the Commission any idea as to the proportion of those in whom the time that had elapsed would be greater than a year?—I could not say without going through the entries carefully.

15,854. Could you tell the Commission whether the proportion was a large or a small one?—A very small proportion, I should say, from looking at them yesterday (but I did not look at them with that view) would be over the 12 months.

15,855. The very large proportion then would be within the year?—Yes.

15,856. If there be any error in the years prior to the year 1868 in the total number of vaccinations, would the error be in the direction of there being too few represented or too many, owing to the anomalous nature of the entry for private vaccinations in 1862 and 1867; would the general effect be to make the total number of vaccinations from 1862 to 1868 greater or less?—The total number is quite correct with those recorded.

15,857. The total number must be correct?—Yes.

15,858. And would the proportions of public to private be incorrect?—Yes.

15,859. (*Chairman.*) Why do you say the totals must be correct?—Because they have been counted from the register.

15,860. You may say it is absolutely correct as counted from the register, but if you find only 18



entered as by private practitioners and it is conceivable that there may have been an omission to enter some, then it would not be correct?—But I think the others can be accounted for by death and removal.

15,861. (*Dr Collins.*) At what time is the vaccination register book in a given year finally closed?—On the 31st December now; the book is made up from the 1st of January to the 31st of December, but it is not closed; if there are any born in that year vaccinated in the subsequent year, they go and put them in.

15,862. Then the book is not closed upon the 31st of December?—It is not closed.

15,863. Then when is it closed finally?—Never absolutely, although after the first two or three years it would be very exceptional for a case to have to be entered.

15,864. Do they ever have to re-open a vaccination register of five years old?—I should say not, but I have not made the inquiry.

15,865. Who would give the Commission that information?—The Vaccination Officer.

15,866. (*Mr. Meadows White.*) Do you keep the register yourself?—No.

15,867. Who is the person responsible for making those entries?—The Vaccination Officer under my supervision.

15,868. But does he not keep the register of births?—No; the registrar of births and deaths would supply him with the returns of births, which form a separate register, for vaccination purposes. Prior to 1868 the registrar of births and deaths did keep the register of births and vaccinations too.

15,869. We were discussing the years before 1868; in those years it would be their duty if they received a registration of vaccination of a child to look back to

see when the birth of the child happened, and enter the vaccination at that date?—Yes.

15,870. By the Vaccination Officer you do not mean the medical vaccination officer, but the officer who has to see that the vaccinations were carried out?—Yes.

15,871. He enters the vaccinations, but afterwards they are entered up opposite the register of births—is that so?—No; the registrar of births and deaths supplies a copy of his books to the officer for vaccination purposes, and when he receives a certificate of successful vaccination he enters that up in the book.

15,872. (*Chairman.*) As I understand, prior to 1868 the returns of vaccination went to the registrar of births, but now the registrar of births supplies a list of births to the Vaccination Officer, and he looks after the records of vaccinations of those whom he has been told have been born; that is so, is it not?—Yes; and even prior to 1868 the book kept for vaccination record purposes was a distinct book from that kept for the purpose of registering births; it was a copy of the register of births so far as name and date went.

15,873. (*Mr. Bright.*) Would it be possible for the Commission to have the gentleman here who entered them up?—No; he is dead.

15,874. (*Dr. Collins.*) Would it be possible to ascertain whether the vaccinations of children of more than one year of age which took place in 1871–72 were numerous or not?—Yes.

15,875. Would you ask for that information from the Vaccination Officer?—You can have it on the return made at the time.

15,876. (*Mr. Picton.*) How long has the present Vaccination Officer held his position?—Since 1868.

15,877. (*Chairman.*) He can bring the books up?—No doubt.

15,878. (*Mr. Bright.*) The man who kept the books in 1867 is dead, is he not?—Yes.

The witness withdrew.

Adjourned till Wednesday next at 1 o'clock.

## Sixty-fifth Day.

Wednesday, 13th May 1891.

PRESENT :

The Right Hon. THE LORD HERSCHELL in the Chair.

Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. WILLIAM JOB COLLINS.

Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary.*

Mr. WILLIAM HENRY MASKELL called in and examined.

15,879. (*Chairman.*) You are Vaccination Officer for Leicester?—Yes.

15,880. Is that for the whole borough?—Yes.

15,881. When did you become the Vaccination Officer?—In 1868.

15,882. Since that date have the books containing the records of vaccination been kept by you?—Since 1871. Previously to that time they were kept by the registrar of births and deaths.

15,883. You know nothing of the books yourself prior to 1871?—Excepting that they have been in my possession. From 1868 to 1871 the vaccinations were all entered by the registrar, and in the year 1871 the registration of the vaccinations was turned over to me.

15,884. Take the year 1871, the public vaccinations registered were 2,764; would those be all the vaccinations which took place in the year 1871, or would they be confined to vaccinations which took place in the year

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*Mr. L. P. Chamberlain.*

6 May 1891.

*Mr. W. H. Maskell.*

13 May 1891.



Mr. W. H.  
Maskell.  
13 May 1891.

1871 of children born in the year 1871?—It would include the whole of the children that were vaccinated by Public Vaccinators in 1871; not the children that were born in 1871.

15,885. Without any reference to when they were born: any child vaccinated in 1871 would come into that record?—Yes.

15,886. Would adults re-vaccinated by the Public Vaccinator come into the same?—No; there is no registration whatever made of re-vaccination.

15,887. It would be confined, then, to the persons vaccinated for the first time?—Yes.

15,888. But it would include all who were vaccinated for the first time that year, whether they were born in that year or in a previous year?—Yes.

15,889. Have you the books for 1871 there?—I have. It is in two districts, the east and the west districts, and the books I have handed in relate to the east district.

15,890. I see that the book is made out upon this system: the first column contains a consecutive number?—Yes.

15,891. Is that a consecutive number beginning from the beginning of the year or what?—They go to 500 and then commence again at No 1.

15,892. Then comes the "Date of birth or age, according to the vaccinator's certificate"?—Yes.

15,893. "The name"?—Yes.

15,894. Then "Name of child," "Sex," "Name and surname of parent," "Occupation of parent," "When registered"?—That means when the birth is registered.

15,895. Then "When the notice was given pursuant to Vaccination Act" and "To whom"?—Yes.

15,896. Then "Register of successful vaccinations," divided into two columns; "Medical certificate of successful vaccination"; "Name of medical man by whom the certificate is signed"?—Yes, and there is another column which you have missed, I think, in the case of insusceptibility.

15,897. There is no such column in the book I have before me?—There is after 1871.

15,898. I thought that this book you have given me showed the vaccinations in 1871, but take the second entry in it. October 10th, 1871, is the date of the birth, and the date of the medical certificate of successful vaccination is February the 14th; I suppose that would be 1872?—Yes; I did not keep the books at that time, consequently I do not know how they were registered at all. If your Lordship would take the book for 1872 it would be slightly different in the form.

15,899. But 1871 is a somewhat important year, and one wants to get as far as possible at how the 1871 numbers are arrived at. You did not make out this calculation of the numbers for Mr. Biggs or Mr. Chamberlain, did you?—No, I know nothing of the numbers, except that Mr. Biggs when he came to me asked me to read out the numbers on each page that were successfully vaccinated. I did so; he put down the figures, he took them away, and I know nothing more of them.

15,900. Have you the book for 1870 there?—I did not keep them in that year; I began in the latter part of 1871, but I had to keep them till the old books were used up.

15,901. Some of them I notice have nothing in the "Successful vaccination" column?—Where there is nothing in the column they were not vaccinated.

15,902. Of course you do not know anything of those books except that they have been in your possession?—No.

15,903. Now we will come to the first book you kept, that commences when?—January 1872.

15,904. Of what, vaccinations?—No, the register of births.

15,905. But the first one is November the 25th, 1871?—It would be after that. You will find that is where I commence in that book.

15,906. It begins, "Notices given pursuant to the Act" upon the 1st of January 1872?—Yes.

15,907. Although in a few cases the births would be before that date?—Yes, but I think that you will find that they are all registered after the 1st of January; there is the register of the birth and the date of the registration.

15,908. You do not have here the date of the registration, do you?—First there is the date of the birth and then there is the date of the registration.

15,909. No, the columns are "Entered in the birth register," "When born," "Where born," "Name of child," "Sex," "Name and the surname of father," "Rank and occupation of parent," and then comes "Notice given pursuant to Act"?—That would be the registrar who would give notice to the parents when they registered the child to get it vaccinated within three months, and that is the date at which the registration is really made. It is born previously, but it is registered about a month or six weeks afterwards.

15,910. Therefore the date at which notice is given pursuant to the Act will always be the date of registration?—Yes.

15,911. The register as kept by you contains more columns than the earlier one to which I called attention. There is "Date of certificate of successful vaccination," then "Certificate of insusceptibility or of having had small-pox"?—Yes.

15,912. Then "Date of death" in case of the child being dead before vaccination, and "Number in the officer's report book," those are columns which did not appear in the old book?—No.

15,913. Supposing a child which had not been vaccinated were taken to be vaccinated, say, while an epidemic was going on, would it come into the register necessarily at all: that is to say, taking the instance of a child in whose case the vaccination had been omitted for two or three years, supposing the parent took the child to be vaccinated and it was vaccinated, would it be entered anywhere?—It would either be entered, if the birth could be found in the birth register, in the proper column there, or if it could not, you would find at the latter end of the book those which are not so found. There are a great number which are entered with the date of the vaccination and by whom the vaccination was performed, so that they all come into that year.

15,914. They come in together?—Yes, they are accounted for in that year amongst the total number vaccinated.

15,915. Your year's books do not end with the births of that year, but end with the births registered?—Yes, births registered within the year.

15,916. And then you enter in the column the successful vaccination, whenever it takes place, though it was in the subsequent year?—Yes.

15,917. Then when you have entered them up to the registration in December, you enter at the end of the book those who have been vaccinated and who were not accounted for in the registration?—That is so.

15,918. But supposing that any of them have been entered in the books for the former years you would have entered that against their names in the books, I suppose?—If I could have found it I should, otherwise it is put on what we term the "special sheets" at the end of the year. When they come in they are entered on the special sheets, and at the end of the year they are all put on at the back.

15,919. Then does this book comprise all those cases in which you were not able to enter them in any other book who were vaccinated in that year?—Yes; the next year commences a fresh sheet which goes into 1873.

15,920. Those would be the cases which were vaccinated by the Public Vaccinators?—Yes; they would be the cases vaccinated by the Public Vaccinators.

15,921. Supposing that similar children of two years, eleven years, one year, and so on, had been vaccinated by private vaccinators, would they find their way into this at all?—If a certificate of successful vaccination were forwarded to the registrar they would be included in that book. Under the present system they would be almost sure to appear in that, because the certificate would under any circumstances, if it were done by a private practitioner, reach me as the Vaccination Officer.

15,922. Was that the case in the years 1871 and 1872?—In the year 1872, but not in 1871.

15,923. Do the medical men who perform the vaccination forward the certificate?—It is the parents' duty if it is done by a private practitioner to forward the certificate to the Vaccination Officer within eight days; if not they are liable to a penalty of 20s.



15,924. Do you think that is always complied with?—Nearly always. The experience we have had in these later years since the work has got behind has been this: that when I go to the houses personally to inquire I do not find above five in 1,000, perhaps, where the children have really been vaccinated and no certificate has been forwarded.

15,925. Are all the subsequent books kept in the same way as this?—Yes; and returns are made every half year to the Local Government Board of the numbers who are vaccinated.

15,926. Does the return show when they were born?—Yes, the record shows when they were born, half yearly.

15,927. Does that show when they were vaccinated?—No; it only shows the total number vaccinated in the half year and then the total number in the next half year.

15,928. Do you mean the total number without regard to when they were born?—No, all that were born in that year; because those returns are made every half year, and about six months after that a supplemental return is made including then the whole which have been vaccinated during the time from the date of the birth up to that time, which would very likely be two years. There might be many which did not go into the first return who would be vaccinated and entered back, or who would go in upon a supplemental return.

15,929. So that this return would be a return of the number of births, a return first of all of the number of those vaccinated during the year, and then a supplemental return to correct this?—Yes, taking in those vaccinated after the returns had been forwarded to the Local Government Board.

15,930. Would there be any such cases as those which occur at the end of this book of children vaccinated who might be three or four years of age?—No; they would not be shown on that return.

15,931. What is there to distinguish between the public vaccinations and private vaccinations?—There is nothing to distinguish except by myself knowing which are the public vaccinations, as I should know whether any vaccination was done by a private practitioner or by the Public Vaccinator, except so far as this, that if a Public Vaccinator in his private practice vaccinated a child his name would be to it, and I should not be able to distinguish whether it was a public or whether it was a private vaccination.

15,932. You had nothing to do with counting up these figures or entering them in this return which is before us?—No; all that I had to do with them was to furnish any information of the numbers which I was required to furnish. Mr. Biggs asked me to call out the numbers in the old books of those who were vaccinated; I did so and he put down the total; he took them away and made his own addition, and I know nothing at all about the return or the working of the figures out.

15,933. (*Mr. Meadows White.*) Did you give Mr. Biggs the cases of vaccinations on the special sheets or did he confine himself to those born in the year?—I do not know what year; it would be but about 1881 or 1882 that the Guardians called for returns of children vaccinated born within the year; they called for that return about the middle of January of the next year, consequently there was one third, or one fourth, at all events, of those children who were not of a vaccination age at the time those returns were made out.

15,934. Did you give Mr. Biggs the information as to the vaccinations which were entered on the special sheets?—Yes; they are all included in Mr. Biggs' returns, that is, in the old books. I do not know anything about the new books. I did not give him the number, and how he got the number I do not know; it was only the old books that were of long standing that I have given him the figures from.

15,935. (*Mr. Whitbread.*) How does it happen that in the first column a child is often five or six years old when it is entered?—The registrar is dead by whom this register was kept, but the certificate of vaccination was then in a different form from that which it is in now when the child was born. The parents had a printed form given to them, and when the child was vaccinated that form was supposed to be signed by the doctor and sent to the registrar. Many of them lost their papers; they were then made out in duplicate and sent to the registrar, and then entered in those columns

where you see 10 or 11 and sometimes more of them together.

15,936. (*Chairman.*) If the registrar received the certificate it would be his duty to enter it up in the book?—It would have been at that time.

15,937. But of course it would all depend upon his making the entry?—Yes.

15,938. If he omitted or forgot to make the entry there would be no other record of it; there was no check upon him in that respect?—No.

15,939. (*Mr. Whitbread.*) Is this book an exact copy in the second column of the register of births?—I should think so; that is the address of the person that is born.

15,940. But I want to know does this book in that column represent every name which is on the register of births?—Yes, certainly.

15,941. Every one?—Yes, and these are the consecutive numbers tallying with the original birth register.

15,942. (*Mr. Meadows White.*) In the year 1863 it is stated on a diagram (*Diagram A.*) handed in by Mr. Biggs that there were 3,928 extra vaccinations performed at the public expense, which are not shown upon the chart; would those be in your books?—They would be sure to be in the books if the number is right; they are all in those books. I called out the number of every vaccinated child which is in those books to Mr. Biggs, and he put down the figures, so many on each sheet, and he took away his paper and made his addition, and I know nothing further about it after he left the office. Possibly that large number of extra vaccinations might be taken from the official returns of the public vaccinators.

15,943. Do you look up the people when you have notice of the birth of a child?—Yes, every Monday. Notice is sent to the parent of the child about a week after it becomes three months old. Every Monday morning from week to week as a child becomes three months old notice is sent to the parent that I have not received the certificate now due of the vaccination of the child; that is sent by post. If they do not comply with the notice, it is my duty to make out another form and to take it myself personally if I can find them, and leave a notice requiring the child to be vaccinated within 14 days; and if I can find it out then it rests with the guardians to take steps to enforce the law.

15,944. (*Mr. Picton.*) I suppose it would not be possible to enter a child as vaccinated unless it had been really vaccinated?—Not unless the certificate had been forged and forwarded to me.

15,945. But it would be quite possible to omit some children as vaccinated which had not been vaccinated?—I should not think there was one per cent. who had been vaccinated and not registered.

15,946. (*Dr. Collins.*) Does not it sometimes happen that the parents of children born in one district migrate into another and are vaccinated there?—Yes, the certificate is sent to the Vaccination Officer in the district where the child is born, and an entry of it is made in the special sheets which are bound at the back. The original certificate is sent to the Vaccination Officer where the child is born.

15,947. Is the locality to which the parents go, always known?—No, there are lots of them get away and we know nothing about where they go to; but if the child is vaccinated and the vaccination certificate comes into the hands of the Vaccination Officer he would forward it to the Vaccination Officer of the district in which the child was born.

15,948. But there might be children vaccinated for whom there was no certificate rendered, might there not?—It is possible; but very few I should think under any circumstances.

15,949. Probably you are aware that every year in the report of the medical officer of the Local Government Board there is a digest of the Vaccination Officers' Returns with regard to children whose births were registered during certain particular years?—I do not quite follow your question.

15,950. Do you furnish any figures to the Local Government Board respecting the vaccination of children in your district?—Yes.

15,951. Do those figures that you return relate to the births within a certain year, or to the vaccinations within a certain year?—To the births within a certain year.

Mr. W. H. Maskell

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Mr. W. H.  
Maskell.

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15,952. So that if a child were born in 1871, and vaccinated in 1872, for which year would the return be?—It would go into the 1871 return.

15,953. Not into the 1872 return?—Not into the 1872 return.

15,954. So children vaccinated several years subsequently to their birth are referred back to the year in which they are born?—If it can be found; if not they are entered at the end of the book on the special sheets.

15,955. When do you finally close your register?—It is never closed. If a child were vaccinated at 13 years of age, if the certificate came to me, I should find the birth register if possible; if it were not possible I should enter it at the back of the book on the special sheet which would be bound up, for the same year.

15,956. If it were only three or four years of age?—I should do just the same, I should refer to the birth register if I could find it, and if I could not find it I should enter it upon the special sheet.

15,957. In what proportion of cases are you able to refer back to the special year to which they belong?—Nearly all of them.

15,958. Even so far back as 13 years?—Yes.

15,959. Are the returns afterwards corrected?—After the returns have gone to the Local Government Board there is a supplemental report, but there would be no alteration after that.

15,960. So that there might be some additions to be made to the figures?—There might be a very few added.

15,961. Such correction as was necessary would be by way of addition?—It would be by way of addition, but it would be very small.

15,962. I think you told the Commission you had been Vaccination Officer for Leicester since 1868?—Yes.

15,963. Therefore, I suppose, it has been part of your business to know to what extent vaccination has been carried out in Leicester?—Yes, I think I know as well as any man can know.

15,964. Have you any reason to think this statement by Dr. Walter Crane, the Medical Officer of Health for Leicester in 1870, is incorrect in which he says, "I am happy to be able to say vaccination has been sedulously attended to"?—I believe that is correct.

15,965. (*Chairman.*) I thought you were not appointed until 1871?—I was not as registrar of vaccinations until 1871, but I had to serve the parents with notices immediately on my appointment in 1868; I had a list of these births from the register, and I had to find the parents and give them notice and see that the children were vaccinated, and if not, to make a report.

15,966. (*Dr. Collins.*) What was exactly the nature of the change made in your duties in 1871?—A very great deal. I was made registrar of vaccinations in addition to being Vaccination Officer.

15,967. (*Chairman.*) In 1867, for example, you had only 1,450 vaccinations out of about 3,500 births?—I was not appointed at that time.

15,968. When did you begin?—In 1868 I was appointed Vaccination Officer.

15,969. Did you begin from the 1st January 1868?—I think it would be the 1st August. I was appointed in July, and commenced my duties on 1st August.

15,970. (*Dr. Collins.*) Whose duty would it have been in the year 1870-71 to secure the carrying out of the orders under the Act?—Mine.

15,971. (*Mr. Meadows White.*) The registrar gave the notices, I suppose?—He always gave notice when the child was registered to get the child vaccinated within three months; it was a printed form reciting some clauses of the Act and it was stamped for postage with my address put upon it, so that when a child is vaccinated that is put in the post by the doctor and it comes to me.

15,972. (*Dr. Collins.*) The duties which devolved upon you in 1871 were chiefly duties of registration?—Yes.

15,973. Were there any new duties besides those of registration?—No, the other duties were carried out the same before 1871 as afterwards.

The witness withdrew.

Mr. C. H.  
Hopwood.

Mr. CHARLES HENRY HOPWOOD, Q.C., further examined.

15,974. (*Chairman.*) When you were last before the Commission you were giving them a sketch of the legislation and the discussions in Parliament which preceded the legislation and the decisions which had taken place upon the statutes; you had brought your review down to the decision in *Allen and Worthy*?—There is just a small portion of the judgment of the Lord Chief Justice, which I think would be necessary to complete the note, the rest of it I will pass over. I think this will follow on directly upon my last quotation: "Now in this case the appellant received notice from the registrar to have the child vaccinated, which brings the case within section 31. The matter was brought before the Justices, and they made an order for the vaccination of the child. The order was not complied with, an information was laid against the appellant, he was convicted and a penalty was imposed. Nevertheless, the order of the Justices was not complied with. The matter was again brought before the Justices and a fresh order to have the child vaccinated was made, that order was disobeyed, and now the appellant has been convicted for the disobedience of that order which is an offence under section 31. It is said that the powers given by section 31 cannot be exercised *toties quoties*, I was at first disposed to think that there was some foundation for this contention; but the Solicitor-General has satisfied me that it is competent to Justices to make an order *toties quoties*, as it shall be shown to their satisfaction that the notice has not been complied with, and that the child remains unvaccinated. The language is general; I do not see anything to control it; and, when we look to the intention of the Legislature, I think we are bound to give a reasonable construction to this, which was evidently intended as a remedial Act. The question seems to have been agitated in the public mind as to whether vaccination is, or is not, a beneficial measure; however that may be, the Legislature has thought fit to make it compulsory. I think, therefore, that the intention of the Legislature was not simply that a

"penalty should be imposed on a person once for all if he omitted to do that, which, in the view of the Legislature, public health and safety required, but that a penalty might be imposed so long as disobedience to its enactments continued. I therefore hold that the powers given by section 31 are not confined to one order and one conviction, but that the proceedings may be repeated *toties quoties* so long as disobedience continues." The Lord Chief Justice then proceeded to deal with the second of the reasons, and held that the certificate that the child was not in a fit state to be vaccinated did not constitute a defence under section 31, and Mr. Justice Mellor and Mr. Justice Hannen concurred on both points. Now with deference to the Court the reasoning is hardly satisfactory. In *Pilcher v. Stafford* the Court had held in construing equally strong words in the statute of 24 & 25 Victoria (1861) that they did not authorise more than one conviction. Thus stood the law until the Act of 1867 passed, which contained the much quoted 31st section. To this the Court gave the effect of an express enactment that the prosecution might be repeated as long as the child remained unvaccinated, or under 14 years. But surely it would have been sufficient to hold that two offences only were created by the Statute and that one conviction under each, *i.e.*, two in all, might take place and thus they would have avoided, and perhaps ought to have avoided, deciding to the contrary of the long established authority, that a man cannot be convicted more than once for the same offence. Another sufficient reason for section 31 was to prevent the escape of some, owing to the Summary Jurisdiction Acts, which took away the Justices' power over an offence more than six months old. What the judges have done by their judgment is what Parliament repeatedly refused to do. The limit of 14 years inserted in the section was probably meant to cover the evasions which might have occurred since the passing of the Act in 1853. That Act came into force on the 1st of August 1853, and allowed three calendar months after the birth for vaccinating children. The Act of



1867 came into force on the 1st January 1868. The period of 14 years, within one month, covers the interval between the two Acts. In support of this view we may refer to the Bill of 1866, the year before in which the limit inserted was 13 years, and brought in by the Government in that form. Another remarkable part of the decision is that the certificate of unfitness in health, or of insusceptibility to vaccination, declared by section 34 to be a defence, is held by the Court to be none as to section 31, so that the father of a child which ought not to be vaccinated, or whom it was useless to attempt to vaccinate, may be prosecuted over and over again because his child is not vaccinated. It is right to add that the Court said the Justices ought to consider it, but the statute expressly states that the production of such a certificate shall be "a sufficient defence." The Act of 30 & 31 Victoria, chapter 84 (1867), consolidated the law and made some amendments in its administration, but section 31, already commented upon and the subject of the decision in *Allen v. Worthy*, was the only new provision which I wish to notice. As a specimen of the arguments addressed to the House in introducing the Bill to Committee on the 14th June 1867, Lord Robert Montague said (I quote from Hansard), "Small-pox differs from other epidemics in this, 'that it is one of the worst, but is absolutely preventible. In other diseases all that can be done by the removal of predisposing conditions is to mitigate their virulence, but small-pox may be altogether prevented.' Of course he only stated what he was instructed to state, but it shows the then opinion of the authorities. In regard to the Act of 1853 I should like to be allowed to make a quotation from the Letter of Dr. Edward Seaton to Viscount Palmerston with the 'Report on Small-pox and Vaccination in England and Wales and other countries, and on compulsory vaccination, with table and appendices, presented to the Epidemiological Society, ordered by the House of Commons to be printed 3rd May 1853.' My reference is to page 4, paragraph 1: 'Small-pox is a disease to which every person is liable who is not protected by a previous attack, or by vaccination. In its unmodified form it is fatal to about 1 in 4 or 1 in 5 of all whom it invades, and when it does not destroy life it in many instances disfigures and deteriorates the general health. Every case of it is a centre of contagion and every unvaccinated or imperfectly vaccinated population is a *nidus* for the disease to settle in and propagate itself. To the two latter propositions," he goes on to say, "which do not admit of being controverted, we call your special attention, for it is on these we conceive must be based any enactment for rendering vaccination compulsory. If it admit of doubt how far it is justifiable in this free country to compel a person to take care of his own life and that of his offspring, it can scarcely be disputed that no one has a right to put in jeopardy the lives of his fellow subjects." This seems to have been adopted in part, but added to by Lord Lyttleton in Committee on the Bill of 1853 (Hansard, volume 125, page 1009). "Another objection," the noble Lord said, "urged against the Bill was that it was an undue interference with the liberty of the subject. This objection, however, he considered was founded upon an entire misapprehension of the nature of the evil and of the remedy to be applied. It might be very well urged that parents had no right, even looking to their own children alone, to allow them to take the disease, but the proper object of the Bill was to prevent persons spreading the infection to others, which he considers in reality a criminal act. The principle of the Bill had indeed been already admitted, for it had been made illegal and punishable either to inoculate children or to expose them, so as to be infectious, and leaving them unvaccinated came under the last head." He here refers to the Act of 1840, 3 & 4 Victoria, chapter 29, which forbids "Inoculation with variolous matter or by wilful exposure to variolous matter." He thus puts a healthy person unvaccinated among the category of persons actually infected with the disease. I should like to make another quotation from Dr. Seaton's letter, he says at paragraph II.: "We are ourselves satisfied, and it is the concurrent and unanimous testimony of nearly 2,000 medical men with whom we have been in correspondence, that vaccination is a perfectly safe and efficient prophylactic against this disease. This proposition we hold to be proved. 1. By the general immunity with which it is found that those who have been vaccinated can mingle with small-pox patients, a fact so

familiar that we do not feel that we need adduce any illustration of it. 2. By the gradual decrease which has taken place in the mortality from small-pox as compared with the mortality from all causes since vaccination has been introduced and been generally received." Now returning to the detail of the statutes and Parliamentary proceedings, I may be allowed to interpolate here, though out of date, the statute of 21 Vict. cap. 25, A.D. 1858, which I omitted and to which I was referred by one of the Commissioners. It amends 16 & 17 Vict. cap. 100. Section 7 provides that registrars are to deliver books, &c., to medical officers, &c., without requiring payment for the same. The next in order, the 31 & 32 Victoria, chapter 70, that is the year 1868, created the Local Government Board, to which thenceforth all existing powers as to vaccination were transferred. In 1869 the Marquess Townshend introduced a Bill into the House of Lords to "further amend the practice of vaccination" (Bill No. 85), of which clause 1 was as follows: "Every medical officer or practitioner who has entered or shall enter into a contract for the vaccination of the poor under the said recited Acts shall affix conspicuously in the room or place wherein the operation is performed a certificate signed by two legally qualified medical practitioners that the variolous matter used by such medical officer or practitioner has been taken from a healthy person or child, whose name, address, and age shall be accurately stated in such certificate; and every medical officer or practitioner neglecting to affix such certificate as aforesaid shall be liable on conviction before two Justices of the Peace to a penalty not exceeding 5*l.*, and in default of payment thereof to be committed to the house of correction or common gaol of the county for a term not exceeding one calendar month." The Bill was introduced and read a first time on April 29th, and was withdrawn on July 15th. On May 12, 1870 (Hansard, volume 201, page 1560), Mr. Candlish and Mr. Sergeant (afterwards Sir John) Simon introduced the Vaccination Act (1867) Amendment Bill [Bill 126], which proposed to enact, by section 3, that "no more than two orders shall be made under the 31st section of the Vaccination Act, 1867, for the vaccination of any one child." The Bill was read a second time on Friday, May 27th, on a division of 18 to 8. On July 6th, 1870, on resuming debate Mr. Candlish said as to the Act of 1867: "He believed the construction put upon that Act by the law court was never intended by Parliament when it was passed. It was a mere verbal accident that the penalties of vaccination were made continuous." Mr. Bruce promised, if the Bill was withdrawn, to appoint a Select Committee next session. This was done and I will presently notice it more fully. Mr. Charles Gilpin, M.P., in addressing his constituents in 1870 at Northampton, thus expressed himself: "I have always thought that when we try to enforce one of the everchanging opinions of medical men we touch upon the liberty of the subject, and the rights of human nature. I find that a number of parents are fined because they are convinced that vaccination is useless and injurious. I ask what is the character of those parents? Are they idle? Are they dissolute? Are they drunken? Are they careless of the welfare of their children? The answer is emphatically, No. They are thoughtful, they are industrious, they are sober, they are men who look to the reason of things, and who decline to be driven into any course of conduct which they do not rationally approve." He then instances the resistance to church rates by Quakers, and concludes: "As the Society of Friends has demonstrated, no law can survive under the persistent protest of conscience." On 13th February 1871, Mr. W. E. Forster moved that a Select Committee be appointed to inquire into the operation of the Vaccination Act, 1867. He said: "Opposition to vaccination is not heard in the House of Commons; but it is found, I am sorry to say, among certain persons in the country who have carried their resistance to an extent that has been injurious to health and destructive to life." He repeated the well-known statements of the awful mortality prior to and the reduction of it by vaccination, the immunity enjoyed by the vaccinated and re-vaccinated; as if none of these assertions could be contested, and added, "The Government do not entertain any doubt. . . . They have to contend with opposition, the opposition of ignorance; and also, I am sorry to say, with the opposition arising from interested motives" (he does not show what these are) "preying upon that ignorance, and lastly, with the great neglect

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"arising from apathy." The Committee sat and took evidence.

15,974a. (*Chairman.*) We have had the evidence and the Report of the Committee of 1871 very fully before us?—Then I would beg merely to quote a passage from the Report of the Committee, as it is very short and it leads up to my account of what took place in the House of Lords. The Committee reported, "That the cow-pox affords, if not an absolute, yet a very great protection against an attack of small-pox; and an almost absolute protection against death from that disease." The Committee on the question of the accumulation of penalties "must express great doubt whether the object of the law is gained by thus continuing a long contest with the convictions of the parent. . . . as your Committee cannot recommend that a policeman should be empowered to take a baby from its mother to the vaccine station, a measure which could only be justified by an extreme necessity, they would recommend that whenever in any case two penalties, or one full penalty have been imposed upon a parent, the magistrate should not impose any further penalty in respect of the same child." This was embodied in the 10th clause of the Bill, and after debate was carried on a division by 57 to 12, and the Bill then passed. When brought into the Lords, Lord Redesdale (18th August) moved to omit clause 10. Lord Halifax for the Government defended the clause, but on a division it was thrown out; seven Contents and eight Non-contents. Lord Halifax, on behalf of the Government, said: "It is the opinion of Mr. Simon, the Medical Officer to the Privy Council, that it is unwise to insist upon anything which is not indispensable, and further that the penalty now proposed will answer all the practical purposes of the Act. It is desirable that public feeling should go with the Act, which will be the case, since the exceptions will be very few, whereas an adverse feeling may be excited to the prejudice of the Act, even if a few prosecutions are persisted in. The strongest advocates of vaccination deprecate repeated fines and imprisonments, which leave the defendant's children unvaccinated." On the 19th of August the Bill returned to the House of Commons, when Mr. Forster said, "The House of Lords has struck out the tenth clause, the important clause which mitigates penalties. That clause was passed in this House by a majority of 57 to 12, and expunged in the other House by a majority of 8 to 7, the total number of peers voting being just equal to the number of the members of the Select Committee, which, after long and careful consideration, came to a unanimous conclusion in favour of the clause. I should have no hesitation in asking the House to disagree to the amendment if the period of the Session could allow of such disagreement being made, without loss of the Bill, but as that is not the case, and as such a course may involve the loss of the Bill, which affects several great improvements, I fear the House has no choice, and must accept the amendment. Although the clause is doubtless an important one, I may remark it is not necessary to other parts of the Bill, and with small-pox raging in the country as it is, I think it will not be safe to postpone the measure. I regret the omission of the clause, because in my opinion it strikes a heavy blow at the principle of compulsory vaccination, which their Lordships, as well as I, think necessary for the health of the country." The Bill then passed. Probably nothing more remarkable than this vote is to be found in the history of Parliament. As I have shown, an attempt was first made by the medical department by an apparently innocent but, as I think, an intentionally ambiguous section, namely, section 2, chapter 59, of the 24 & 25 Victoria, to inflict repeated penalties on anti-vaccinators. This was defeated by the decision in *Pilcher v. Stafford*. In 1856 a Bill, which openly proposed to inflict repeated penalties, brought in by Mr. Cowper for the Government, was withdrawn, but again, in 1866, a Bill was introduced by Mr. Bruce for the Government, after the decision in the case of *Pilcher* against *Stafford*, declaring that a previous conviction should be no answer to renewed prosecution. It was referred to a Select Committee and that provision was struck out. The Bill was withdrawn. In 1867 a similar Bill without that provision was brought in and became the Act of 1867. Mr. Bruce declared that "it laid down no new principle." That Act by section 31, according to the decision in the case of *Allen v. Worthy*, and by "a mere verbal accident," according to Mr. Candlish, authorised the

infliction of repeated penalties. The decision in *Allen v. Worthy*, and the consequent repeated prosecutions, aroused so much feeling in the country, that within four years of that Act coming into force the limitation of penalties to one full penalty, or any two penalties upon a parent for the same child was unanimously recommended by a Select Committee of the House of Commons. A Bill to further perfect the machinery of vaccination, and therefore to make the process of punishment quicker and more easy, was passed through the Commons with this recommendation of the Select Committee embodied in a clause known as clause 10. A motion to omit that clause was defeated in the House of Commons by 57 votes to 12, but carried in the House of Lords on a division, and in a House of 15 members by one vote, in opposition to the urgent appeal of the Government and the wishes of the people as expressed by their representatives. That vote, unwillingly assented to by the House of Commons on promise of its early correction, has by its negative effect been the source of authority for fines of enormous amount on conscientious, unwilling parents and has sent many of them to gaol. It has been stated that the year 1871, and not 1867, is the true date of the commencement of enforcing compulsion. Some instances may be given in correction of this impression. C. Washington Nye was first imprisoned in October 1869. Samuel Beck, of Dorking, was fined for a second child although he produced in court as his "reasonable excuse" an older child bearing evident traces of injuries which the father attributed to the fact of vaccination. George Ridley of Bury St. Edmunds, was fined in September 1869, for the sixth time. The Rev. Mr. Allen, of St. Neots, was committed to prison in September 1869. He was the appellant in the celebrated case of *Allen v. Worthy*. At Ampthill on August 26th in the same year, Messrs. Page, Solesbury, White, and Abbott had fines and costs imposed ranging from 11s. 6d. to 1l. 4s. with alternative of terms of imprisonment from 14 days to two months. Mr. O. Robinson, of Kettering, was fined 10s., and the costs piled up to a total of 2l. The celebrated case of *Allen v. Worthy*, on which rests the whole superstructure of repeated penalties, was decided in November 1869, before the passing of the law of 1871. In August 1869 Mrs. Anne Sipple was committed for seven days' hard labour (the hard labour being wholly illegal) and confined in a stone cell with a baby 18 months old. The baby was deprived of shoes and stockings so that he had to run on the stones with bare feet, and the mother was allowed nothing but bread and water for both herself and her child. Vaccination, it is said (by Mr. Preston-Thomas), was compulsory only in name. Yet in 1869 William Johnson, of Leicester, was imprisoned, but received a testimonial to his services against the Vaccination Acts. Dr. Seaton probably referred to this when he told the Committee in 1871 that the imprisoned anti-vaccinators were in an enviable position, "having silver watches given to them." In this same year, on one single day, September 13th, the vaccination summonses in the Court House of Dewsbury numbered no less than 39. In the "Leeds Evening Express" of October 4th, 1869, was reported the case of Joseph Elmer, who, having the alternative of 20s. or 14 days, declared, "I shall Ernest Jones it," the popular phrase of the day for going to prison on principle. In October of the same year, Mr. Woolrych, of the Thames Police Court, fined a defendant 20s. and costs in spite of the production of a medical certificate of the unfitness of the child for the operation.

15,975. Where did you get that from?—I have not the note here, but I could get it looked up.

15,976. One cannot help suspecting that there was something more than that?—In the case of *Allen* and *Worthy*, the judges say that it is no answer, and I think you will find that Mr. Newton has also fined in the face of a similar defence.\* It is possible they may have doubted the genuineness of the defence. In November John Turnell suffered 14 days' imprisonment. In the same month Captain Tucker, of Watford, was fined 10s. and costs 1l. 13s. 6d. and so threatened with the continuance of these prosecutions that he had to change his abode. Lastly, John Hickingill was sentenced to 14 days' imprisonment ("Yorkshire Post" November 30th, 1869). Besides the above instances the Committee in 1871 say: "Your Committee are glad to find that wherever the Guardians endeavour to carry out the

\* See Question 15,980 (Armfield's case)—C. H. H.



"law it is very generally and indeed almost universally enforced," and further they say: "By section 28, the Guardians of any parish may appoint an officer to promote vaccination and to prosecute persons offending against the Act; and it appears that in the majority of the Unions such officers have been appointed." Then to resume the chronicle of proceedings in Parliament. In 1871 Lord Buckhurst moved in the House of Lords (Hansard, volume 207, page 216) for a select committee to "inquire into the law," with reference to the causes which operate in preventing the carrying out of an efficient system of vaccination. He complained of the absence of a proper number of Public Vaccinators; that in large parishes there were not sufficient vaccinating stations and that private medical practitioners were not compelled to send to the registrar a return of the children whom they vaccinated. After explanation by Earl de Grey and Ripon (representing the Privy Council) the motion was withdrawn. In 1872 (Hansard, volume 209, page 862) Lord Buckhurst repeated his motion to inquire into the operation and efficiency of the vaccination laws but again withdrew it on its being urged "that the Act of 1871 had not had sufficient trial." In the House of Commons, in 1872, Mr. Pease, Mr. Leeman, and Sir Thomas Chambers brought in the Vaccination Acts Amendment Bill (Bill No. 91), clause 3 of which was as follows: "After the passing of this Act no parent of a child shall be liable to be convicted for neglecting to take or to cause to be taken such child to be vaccinated or for disobedience to any order directing such child to be vaccinated, if either (a) he has been previously adjudged to pay the full penalty of 20s. for any of such offences with respect to such child, or (b) he has been previously twice adjudged to pay any penalty for any of such offences in respect of such child." The second reading was moved on July 10th, opposed and adjourned to July 11th, when the Bill was withdrawn (Hansard, volume 212, page 296). In 1874, on the second reading in the Commons (Hansard, volume 221, page 835) of the Vaccination Act Amendment Bill, Mr. P. A. Taylor said that in many parts of the country "a strong and bitter hostility" was growing up against the Acts; and Mr. Newdigate, while supporting the Bill because "prejudices should be overcome," thought "the use of bad lymph should be rendered penal." This Act, 37 and 38 Victoria, chapter 75, was passed to explain the Vaccination Act, 1871. Reciting section 5 of that Act, "And whereas doubts are entertained whether the Local Government Board are empowered under the said Act to make rules, orders, and regulations with respect to the proceedings to be taken by the Guardians or their officers for the enforcement of the provisions of the Vaccination Acts, 1867 and 1871", the Act proceeds to give the Local Government Board power to make rules and orders, &c. for the above purpose. In exercise of their powers they issued a General Order on October the 31st, 1874, prescribing that "the Guardians shall, in all cases in which the provisions of the Vaccination Acts for enforcing vaccination have been neglected, cause proceedings to be taken against the persons in default, and for this purpose shall give directions (a) authorising the Vaccination Officer to institute and conduct such proceedings; but no such directions shall authorise the Vaccination Officer to take further proceedings under section 31 of the Vaccination Act of 1867 in any case in which an order has already been obtained and summary proceedings taken under that section, until he shall have brought the circumstances of the case under the notice of the Guardians and received their special directions thereon." That will be important when viewed in connexion with the celebrated Evesham letter, to which I shall presently refer. This last Act was passed in order to bring the Guardians of the Keighley Union to submission. A number of them were sent to gaol, but after a long contest the Board gave up the struggle, and the condition of Keighley resembles that of Leicester. In 1877 Mr. Pease brought in the Vaccination Law (Penalties) Bill, which was read a first time, and then withdrawn on May the 31st. Section 3, I think, is almost identical with the one I read last against repeated penalties. It provides the same remedies as that did. On January the 18th, 1878, the Vaccination Law (Penalties) Bill was again introduced by Mr. Pease, Mr. Walter James, Mr. Mundella, and Mr. Leeman. On April the 3rd its second reading was moved; you will find this in volume 239 of Hansard, page 478. Mr. Slater-Booth for the Government said, "If the limitation of penalties in the case of con-

scientious objectors was the only object to be attained he would not have so much to say; but he feared that a vast number of persons who did not object to vaccination *per se*, but who found it onerous to have their children vaccinated because of the distance from the medical officer's stations, would take advantage of the Bill." The first objection might have been met by adopting the suggestion of Mr. Danby Fry, already referred to, and the serious objection insisted on as I have shown by Mr. J. W. Henley of compelling mothers to come miles in all weather to and fro, twice at least, might have received more sympathy. Mr. Slater-Booth said later in the discussion, which will be found at page 479 of the same volume of Hansard, "While he would be in favour of limiting the number of prosecutions and penalties, if it could be done consistently with the carrying out of the law, he was bound to say he had seen no plan which in his opinion was likely to effect the object safely. . . . With regard to the 31st section of the Act he would be glad that it should be made clear that Boards of Guardians and magistrates were entrusted with a discretion,—the Guardians as to the institution of prosecutions, and the Justices as to the infliction of penalties. Magistrates should, if they pleased, order cases to stand over, as in other offences. They could even, when the parties were guilty, allow them to go under recognisances to appear if called upon. If that could be made more clear he would not be in favour of interfering with the exercise of this discretion." These statements of Mr. Slater-Booth are exactly contrary to the decisions repeatedly given by magistrates that under the law they had no option but to convict; and when magistrates saying and thinking thus do convict and inflict a heavy fine and costs, the sufferer is absolutely without remedy, there being no appeal. It was first proposed to read the Bill a second time and send it to a select committee, but Lord Randolph Churchill opposed this and moved the rejection of the measure, which was carried by 271 to 82. In 1879 the Vaccination Act (Ireland) Amendment Bill was introduced which amended the machinery for providing vaccination. The second reading was opposed by myself and Mr. Peter Taylor, but we found no support in the House; the Irish members supported the Bill, and it accordingly passed without further opposition as the 42nd and 43rd Victoria, chapter 70.

15,977. (Mr. Meadows White.) Do you omit any reference to the 41st and 42nd Victoria, the Public Health (Ireland) Amendment Act?—I have not mentioned Ireland at all.

15,978. That Act enacted for Ireland exactly the legislation of section 31?—It did very much so; I do not suggest that I am giving any history for Ireland, I have only done it for England so far, but I am obliged to you for the reminder. Then in February 1880 Dr. Cameron introduced a Bill to encourage vaccination by providing facilities for the optional use of animal vaccination. It was withdrawn March 10th, 1880. In the second session of 1880 the Vaccination Acts Amendment Bill was introduced by Mr. Dodson and Mr. Hibbert, with similar provisions for limiting prosecution to those already mentioned. It was read a first time on June 16th and withdrawn August 9th, in consequence of the expressed views of the medical profession. In 1882, on February 9th, Mr. Peter Taylor moved for leave to bring in his Vaccination Acts (Compulsory Clauses Repeal) Bill. Mr. Warton opposed this on the ground that the Bill was "nothing else than a Bill for promoting the spread of small-pox." Leave was given by 107 to 48 and the Bill read a first time next day. On August 9th it was withdrawn. In 1884 Mr. Peter Taylor brought in again his Vaccination Acts (Compulsory Clauses Repeal) Bill, which was withdrawn. On February 10th, 1888, Mr. Picton brought in a Bill called the Compulsory Vaccination Bill, to repeal so much of the law as compels under penalty the practice of vaccination. It was withdrawn; I think that was the last Bill introduced. I next propose, with the leave of the Commission, to call attention to some of the questions asked, and some other proceedings in the House of Commons on the subject of vaccination. These are all in the House of Commons, with the various answers of ministers upon interesting points. On March 16th, 1876, Mr. Peter Taylor asked (Hansard, volume 228, page 62) whether Mr. F. Pearce and Mr. Harvey, of Andover, had each been punished 20 times for non-compliance with the provisions of the Vaccination Acts. Mr. Slater Booth,

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in reply said (page 63), "Cases of the kind were of frequent occurrence," and he then laid before the House the now famous Evesham letter, which I will, with the leave of the Commission, read here.

15,979. (*Chairman.*) It will be enough to refer to it; we have had the text of it already before us; that is the letter from the Local Government Board, is it not? —Yes. The only object I have in reading it is to show how closely it paralleled with the directions of the Local Government Board, which have not, in fact, been followed.

(*Chairman.*) Any particular point like that which you wish to mention pray mention, but the document we have already on our notes.

15,980. (*Mr. Picton.*) You might point out the passages in which the parallel arises, which probably would consist of a few words?—The Board itself points out. The letter says: "The Board at the same time direct me to point out that by Article 16 of their above-mentioned order it is provided that in any case in which a magistrate's order has been obtained, and summary proceedings have been taken under section 31 of the Vaccination Act, 1867, no further proceedings shall be taken by the Vaccination Officer without the express instructions of the Guardians. The intention of this provision is that the Guardians should carefully consider with regard to each individual case the effect which a continuance of proceedings is likely to have in procuring the vaccination of the individual child, and in insuring the observance of the law in the Union generally." Then the Board goes on to reason upon what it conceives would be the result of either proceeding or abstaining from proceeding, and as it is very short I should be glad if I might be allowed to read it. "The Board may further state that it is, on the one hand, undeniable that a repetition of legal proceedings has in numerous cases resulted in the vaccination of a child when such vaccination has not been procured by the previous proceedings; and it is therefore important, with the view of securing a proper observance of the law, that parents should be well assured that proceedings in case of non-compliance with its requirements will not be lightly discontinued. On the other hand, the Board are prepared to admit that, when in a particular case repeated prosecutions have failed in their object, it becomes necessary to carefully consider the question whether the continuance of a fruitless contest with the parent may not have a tendency to produce mischievous results, by exciting sympathy with the person prosecuted, and thus creating a more extended opposition to the law. The Board entertain no doubt that, in all cases of the kind in question, the Guardians, having before them the preceding observations, will not fail to exercise the discretionary powers confided to them in the manner best calculated to give effect to the policy of the law." On March 23rd, 1876, Mr. Pease (you will find this in volume 228 of Hansard, page 477) mentioned the case of Mr. Milner, chairman of the Keighley Board of Guardians, who had been committed to prison for ten days with hard labour for the non-payment of a fine of 10s. for the non-vaccination of a child. This was an illegal sentence, with other instances of which the Commission have been furnished. On May 22nd, 1876 (Hansard, volume 229, page 1052), Mr. Palmer asked whether two tradesmen of Leicester, Messrs. Palmer and Eagle, were sent to prison for breach of the Vaccination Acts, they having ample goods to distrain on, and whether they were handcuffed, although they made no resistance whatever. Mr. Cross replied "that the statements were substantially accurate. He believed the magistrate had the power to commit persons to prison without first issuing a distress. These persons had only to put their hands in their pockets and pay the money to put an end to the matter." "He was sorry to say it was true that the men were handcuffed. He could not, however, imagine why a man, because he did not pay a small fine, should be treated in the same way as a man who had committed a criminal offence. It seemed to him an abuse of a petty power which he should do his best to put down in the future." On July 4th 1876, Sir Charles Forster called attention to a case of Mr. Sampson Benton, against whom proceedings had been authorised at Walsall after six previous prosecutions. Mr. Sclater-Booth said (Hansard, volume 230, page 945): "It did seem to him unfortunate that repeated prosecutions occurred in so many cases, and the Local Government Board had suggested to the Guardians that after having procured two convictions under the

"Act they should consider whether, under the circumstances of the case, they were likely by repeated prosecutions to ensure the vaccination of a child." On July 25th (page 1,883 of the same volume) Mr. Peter Taylor asked whether Mr. Pearce, of Andover, was again summoned, having already suffered 22 previous convictions. Mr. Sclater-Booth replied that the Guardians in answer to his letter said: "Mr. Pearce was a member of the Anti-Vaccination Society, and that they presumed the society paid the fines in his case. Mr. Pearce . . . stated that two children had then died in Andover, and that two were dying from the effects of vaccination. He (Mr. Sclater-Booth) caused a special inquiry to be made into the truth of the allegation by a competent medical officer, who afterwards reported that there was no reason to suppose that the deaths of these two children were caused by vaccination . . . The whole subject was one of great difficulty, and was constantly under his notice, and he could not but hope that some means would be devised by-and-by to reconcile the due execution of the law with some modification of the punishment provided for its infringement." Another question was asked as to these four children (Hansard, volume 231, page 819), and Mr. Sclater-Booth said that the cause of death was not in any of these cases attributable to vaccination. On August 12th 1876 (page 1,155) Mr. James asked whether Mr. Abel, of Faringdon, had been fined five times since the 8th of March, and that the Guardians had informed him that it was "their intention to continue to enforce these proceedings until he complies with the law." "Mr. Sclater-Booth said he had communicated with the Guardians some weeks ago stating the opinion of the Local Government Board that proceedings under the Vaccination Act should not be frequently repeated, especially when taken by the Guardians, and that it should be considered whether a repetition of prosecution was likely to result in the due observance of the law. The Guardians had replied that Mr. Abel was well-to-do, and was a member of the Anti-Vaccination Society, and that it was impossible to know how much of the fines was paid by the society. They had, therefore, given instructions for the prosecutions to be continued. . . . He had given instructions to the Guardians to consider carefully the course they were taking. He could not say on general grounds that he agreed with the policy of the Guardians, but at the same time the law had vested in them a certain discretion, and it was not competent for him to interfere arbitrarily with their decision." On February 15th, 1877 (Hansard, volume 232, page 388) Mr. Wethered asked as to six deaths of infants at Misterton, near Gainsborough, of erysipelas. Mr. Sclater-Booth admitted the deaths, and that the vacciner was vaccinated with lymph from the National Vaccine Establishment. He admitted other cases in the district, but denied that the lymph was in fault. Mr. Forsyth asked in the same year (you will find this at page 327, volume 233), "whether the vaccine lymph in use was obtained from the original source suggested by Dr. Jenner or was artificially produced by inoculating the animal with the small-pox, also what securities were taken to ascertain the perfect condition of the lymph now distributed by the National Vaccine Establishment." Mr. Sclater-Booth replied: "So far as is known none of the lymph at present in use is of artificial production, the lymphs distributed being either from Jenner's source or from sources of the natural disease of the cow which have since been met with. The securities for the perfect condition of the lymph are first the careful choice of the vaccinators by whom it is collected; second, the inspection to which they and their stations are subjected; and thirdly, the independent microscopical examination, without which no tube of lymph is ever sent out." On July the 11th, 1877 (volume 234, page 1569), Mr. Walter James asked "whether in the case of Joseph Abel, of Faringdon, fined 11 times during 14 months, the chairman of the convicting magistrates on many occasions was also the chairman of the Board of Guardians, and whether the costs in several instances included the payment of a fee to an attorney who was also clerk to the same Guardians." Mr. Sclater-Booth said, "Abel was fined on six occasions, on the others he only paid the costs. The chairman of the Guardians was on two occasions the chairman of the magistrates, and once the magistrates in their discretion allowed the clerk to the Guardians who pro-



"secuted, a fee of one guinea." This fee, Mr. Cross (in answer to Mr. W. E. Forster) said, "struck him as very unusual, and he had caused inquiries to be made respecting it." On June 18th, 1877 (Hansard, volume 234, page 1487), I called attention to the fact that the chairman of the Faringdon Board of Guardians was in the habit of acting as one of the Justices of petty sessions to hear charges or prosecutions at the suit of the Board. Mr. Cross replied that the gentleman did not attend specially when these cases were heard. By statute a Justice was not disabled from acting as such, because he was an *ex officio* Guardian, and in that capacity connected with any case brought before the Justices. On June 12 (you will find this on page 1638 of the volume of Hansard last quoted), I asked whether the chairman did not adjudicate on cases which he had as one of the Guardians ordered to be prosecuted, and whether the clerk was entitled to a fee of one guinea. Mr. Cross replied that this Justice had not taken any part in ordinary prosecutions and that the fee was legal "though he was bound to say he thought the clerk might perform the duty without fee." On June the 25th (and this will be found at page 194 of volume 235 of Hansard) Abel's case was again mentioned by myself on the issue of another summons, and Mr. Cross said he should not wish to give any legal opinion as to the discretionary power of magistrates to refuse to issue an order against a person for the non-vaccination of his children. On June 28th (page 405) the question was repeated by Mr. Pennington on my behalf in my absence to the Attorney-General, the late Sir John Holker, I think, who said that "a magistrate who acts under section 31 of the Act acts judicially, and may make an order or not as he pleases. But I consider that a magistrate, who, after it has been clearly proved before him that a child has not been vaccinated, and that there is no reason why the operation should not be performed, should exercise his discretion by declining to make an order for vaccination, would disregard his duty." On August 6th (volume 236, page 464) Abel's case was once more mentioned as to another summons. Mr. Slater-Booth said he had informed the Guardians of his views regarding repeated prosecutions, and did not consider it was his duty, or, indeed, that he had any right to interfere further. In 1877 (volume 235, page 470) Earl Percy moved that it is expedient "that an inquiry be instituted into the practice of vaccination for the purpose of ascertaining whether it cannot be conducted in a more satisfactory manner than at present." Mr. Pease moved the following amendment "and whether the law relating to the accumulation and repetition of penalties for the same offence does not require amendment." The amendment was supported by Mr. W. E. Forster; Earl Percy adopted Mr. Pease's amendment, but on a division there were 56 for and 106 against. On June 11th, 1880 (this will be found in Hansard, volume 252, page 1811), Dr. Cameron on the Estimates called attention to calf lymph, moving that it was "at least of equal value as a prophylactic against small-pox with the ordinary humanised lymph, and as its use affords an absolute guarantee against the propagation of those human diseases occasionally introduced by vaccination with humanised lymph," a supply of calf lymph should be provided by the National Vaccine Establishment for those who preferred it. Mr. Dodson, for the Government (page 1849), after quoting the recommendation of the Committee of 1871 (this is on the question of penalties) said, that was a proposition that he was prepared to recommend, and the Government intended to sanction the abolition of cumulative penalties. Mr. Slater Booth (page 1851), speaking for the Opposition, said he "fully concurred that no benefit was likely to accrue from repeated prosecutions and convictions in the case of those parents who would not allow their children to be vaccinated. That concession he had endeavoured to effect during the time he was in office." Lord Randolph Churchill said he understood that cumulative penalties were to be abolished. Was a Bill to be introduced to effect that, and if so when? Mr. Hibbert replied for the Government (page 1853), that "in view of the strong feeling existing in the country with regard to repeated convictions the Government would be justified in asking Parliament to pass a measure which would place the matter upon a more satisfactory footing." The motion was then withdrawn. On March 1st, 1881 (Hansard, volume 258, page 1946), Mr. Dodson was asked whether infants were vaccinated within a week after birth or even earlier in some workhouses. Mr.

Dodson replied that the practice had been adopted in some workhouses of vaccinating in the first week after birth, and in some individual cases even earlier. There had been no complaints. The mother's free consent, in many cases, had been obtained, and in others acquiescence in the absence of objection had been assumed. On May 17th, 1881 (Hansard, volume 261, pages 677 and 1775), Sir William Harcourt admitted that six persons had been fined 1*l.* 16*s.* 6*d.* each at Warrington under section 29 of the Vaccination Act, which applies only to children under 12 months old, whereas the children in question were from three to six years old, and that the conviction was irregular as it should have been under the 31st section. He had therefore remitted the fines. In the same volume (page 264) Mr. Dodson stated in answer to me that Dr. Stevens, one of the Government inspectors, suggested to the Board of Guardians of St. Saviour, Southwark, that children born in the workhouse should be vaccinated before leaving, and that subject to the opinion of the medical officer in any particular case this should be done on the 6th day after birth. Dr. Stevens also referred to an opinion of the Poor Law Board given in 1848 that the Guardians could enforce this without the consent of the mother. Mr. Dodson added in response to a further question from me that in his own opinion vaccination could not be enforced in the circumstances if the mother objected. On August 5th, 1881 (Hansard, volume 264, page 978), Mr. Dodson said the awards to Public Vaccinators were given if the inspector was satisfied from a careful personal examination of a considerable number of recently vaccinated children that the scars covered a certain area and were perfectly well marked; that the Public Vaccinator had been regular and punctual in his attendance, and that the cases had been duly certified and registered. On June 13th, 1882 (Hansard, volume 270, page 978), with reference to the verdict of a coroner's jury at Holloway, of death from "shock to the system following vaccination," Mr. Dodson said he had directed an inquiry into the case. On July 3rd, 1882 (Hansard, volume 271, page 1248), Mr. Dodson was not prepared to advise (between calf and humanized lymph) which should be selected. He believed both to be equally trustworthy. It was not within the knowledge of the Board that tubercles had been transmitted by lymph from the calf. On March 6th, 1883 (Hansard, volume 276, page 1606), Mr. Taylor asked whether exception was made in the case of army recruits who objected, or who had been previously vaccinated and who had had the small-pox? Lord Hartington said, "Every recruit without exception is vaccinated on entering the army." On March 8th, 1883 (Hansard, volume 276, page 1758), Mr. Hibbert admitted that Mr. Armfield had been fined at Westminster police-court by Mr. Newton, the police magistrate, for non-vaccination, although he had a certificate from a registered medical practitioner "that the child was not in a fit state to be successfully vaccinated, as it was suffering from an eruptive attack." Mr. Newton did not consider the certificate "a reasonable cause." Mr. Armfield "might have appealed, but he did not avail himself of that privilege." By what law the appeal is provided I don't know, and Mr. Hibbert did not state.

15,981. (*Chairman.*) That might mean that he might have got a case stated?—Yes, there might be also some means of challenging it on certiorari but still one does not usually use the word appeal in exactly that sense. On May the 22nd, 1883 (Hansard, volume 279, page 1908), Sir Charles Dilke, answering a question from me with reference to the allegation of Henry Allen that his child died from the effects of vaccination with calf lymph, said the jury found the death to be from pneumonia following septicaemia from a labial abscess and that the course of the disease was not such as to suggest any connexion whatever between the disease and vaccination. "It was a fact that calf lymph did produce somewhat more decided constitutional symptoms than were produced by average humanised lymph." On June 11th, 1883 (Hansard, volume 280, page 199), in answer to a question from me as to the death of the infant of Rosina Walsh in St. Pancras Workhouse, alleged to have arisen through failure of milk owing to the mother's re-vaccination a day after the child's birth, Sir Charles Dilke replied that the mother did not object and three medical men thought re-vaccination had nothing to do with the failure of the milk. "The Board under ordinary circumstances think it better that any required re-vaccination should not be associated with the incidents of the lying-in-

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"room." At page 789, in answer to the assertion conveyed in the question that Rosina Walsh was not asked to consent, and that she had already been vaccinated and re-vaccinated, Sir Charles Dilke said Dr. Dunlop ought to have inquired as to previous re-vaccination, if he did not do so. On June 19th, 1883 (Hansard, volume 280, page 986), Mr. P. A. Taylor's motion came on: "That it is inexpedient and unjust to enforce vaccination under penalties upon those who regard it as unadvisable and dangerous." An amendment by Sir Joseph Pease was moved for a committee to inquire into cumulative penalties. This was afterwards withdrawn, and an amendment by Dr. Playfair, "That the practice of vaccination has greatly lessened the mortality from small-pox, and that laws relating to it, with such modifications as experience may suggest, are necessary for the prevention and mitigation of this fatal and mutilative disease," was carried; Ayes 16, Noes 286. In the course of that debate Sir Charles Dilke repeated the opinions of Mr. Dodson and Mr. Sclater-Booth, already quoted above, and said (page 1038): "Those opinions are my own opinions also, and they are the opinions of those who are responsible for the administration of the department over which I have the honour to preside. Those who see the actual working of the present law are in fact of opinion that repeated penalties defeat their own object, and that they do not secure proper respect for the law by the people of this country. But just as Mr. Sclater-Booth is doubtful that this is the view of the House I am doubtful also on the same point." He supported Sir Lyon Playfair's amendment because it spoke of "such modifications as experience may suggest, and," he added, "I believe that one of those modifications would be that which is favoured by my predecessor in office, namely, the abolition of repeated penalties." Mr. Sclater-Booth said that in his opinion after the recovery of one or two penalties the Local Government Board inspector should have a discretion as to continuing prosecutions. On August 6th, 1883 (Hansard, volume 282, page 1643), Mr. George Russell said the Government did its best to secure that the humanised and calf lymph supplied by it "should be free from suspicion. He did not see that there could be any more positive guarantee." On August 16th, 1883 (Hansard, volume 283, page 719), I asked as to five children at Deptford, alleged to be suffering from syphilis communicated by vaccination. Mr. George Russell replied that the cases had been inquired into by an inspector. Four children, not five, out of 17 vaccinated from one vaccinator got eczema. Each lived in the state of squalor that most favoured the production of eczema. I asked whether the medical officer of the Board of Guardians had certified that it was syphilis. Notice of this question was asked for. On July the 10th, 1884 (Hansard, volume 290, page 670), I further asked by whose authority the scholars at Henry Street School, St. Pancras, were examined to see whether they were vaccinated. Mr. Mundella replied that the Education Department had not sanctioned, and had no right to sanction any such act. The managers of the school were the only persons who could sanction such an inquiry. On July 14th, 1884 (Hansard, volume 290, page 296), Mr. Mundella read a reply from Dr. Buchanan to the effect that, "As a medical inspector he had examined tens of thousands of children in public and private elementary schools. He informed the master or mistress of his object (namely, to get information as to the efficiency of the local vaccination) and only once had met with a refusal. He gave a list of the unvaccinated to the master and asked him to call the attention of the children's parents to the fact that they were not protected against small-pox." On March the 31st, 1885 (Hansard, volume 296, page 1092), I asked the President of the Local Government Board whether the statement in the pamphlet entitled, "Facts concerning Vaccination," sanctioned by his department, that "none of the nurses at any of the London small-pox hospitals who have been duly vaccinated before entering on their duties have ever caught small-pox" was accurate? Mr. George Russell replied: "The Board are aware of the statement alluded to, and, while they have no reason to doubt that it is substantially accurate, they admit that it might be more guardedly expressed. As regards the Stockwell Hospital, it appears from the report of the medical superintendent in 1882 that four cases of small-pox had occurred among the staff since 1867, three of which were very mild and one severe; but

"in that case the infection was believed to have been contracted before the officer came on duty. At Fulham Hospital we are aware that four nurses had slight attacks which occurred a few days after they entered the hospital, and in each case the disease ran concurrently with re-vaccination. At the Deptford Hospital there was one case in which the disease was incubating at the time of re-vaccination. As regards the Halifax Hospital, the honourable member (Mr. Hopwood) was informed by the late President (Mr. Dodson) in May 1881, that a small-pox patient was sent to the fever hospital and that the matron and staff were strongly urged to be vaccinated, but they refused. The matron three days after showed symptoms of the disease, and on the day following four of the nurses were vaccinated, but in one case small-pox showed itself in two days, and in another in four days. They were, therefore, under the influence of the disease when the vaccination took place. With respect to Lewes Hospital, it is to be inferred from the report of the Medical Officer of Health that the re-vaccination was not performed until the nurse had contracted small-pox. We have no information as to Dr. Bakewell, of Trinidad Hospital (stated in the question to have taken small-pox after repeated re-vaccinations). We believe it is not the general custom in the hospitals of the Metropolitan Asylums Board to employ nurses who have had small-pox. At Fulham 42 out of 295 had had small-pox; at Stockwell 16 out of 340; at Deptford 20 out of 265. The Board are quite willing to bring under the attention of the National Health Society the particular cases to which attention has been drawn." On May 4th, 1885 (Hansard, volume 297, page 1481), Mr. Russell stated that he had informed the National Health Society of this reply. He stated at the same time that at the Sheffield Hospital in 1882 the medical officer and a ward servant, who had both been re-vaccinated, had attacks of small-pox so mild that scarcely any rash appeared. The cook, who had not been re-vaccinated, but who had previously had small-pox, had an attack in a modified form. The only severe case in the hospital at the time was that of a patient who had never been vaccinated. This patient died. In the same volume of Hansard, page 218, Lord Hartington said, in answer to a question, "From the first arrival of the army in Egypt in 1882, down to the date of the latest return, there had occurred among the troops . . . on the Nile and at Suakin 81 cases of small-pox, 7 of which had proved fatal. In 51 re-vaccination was known to have been performed; and it was believed that the regulations had been generally carried out in the remainder." On May 14th, 1885 (Hansard, volume 298, page 482), Mr. Ritchie, answering a question about deaths from small-pox at West Ham, said, "Small-pox is not usually most frequent in quarters of a town otherwise unhealthy, except in so far as the unhealthiness may be synonymous with overcrowding and want of isolation." On July 20th, 1885 (Hansard, volume 299, page 1185), Mr. A. J. Balfour said a child on board the "Castalia" hospital ship whose mother was attacked with small-pox was vaccinated at birth, and again two days after in the hope of averting an attack of small-pox after birth, but unsuccessfully. The medical superintendent no doubt acted rightly. The child afterwards had small-pox and recovered. On September 10th, 1886 (Hansard, volume 309, page 54), Mr. Ritchie said, "If there is one subject on which the Government possess accurate information more than another it is upon the subject of vaccination. . . . I may add that only two years ago an exhaustive inquiry was made by the Statistical Society, not only into cases arising in this country, but all over the world, and they came to the conclusion that the benefits of vaccination were undoubted."

15,982. (Dr. Collins.) What would be the date of the Statistical Society's inquiry?—He stated it as I have read it, but it is corrected in answer to the next inquiry. On March 14th, 1887 (Hansard, volume 328, page 1270) Sir Charles Russell asked for particulars of this "exhaustive inquiry." Mr. Ritchie said, "This statement was afterwards found not strictly accurate. It was not an inquiry but a discussion which took place at the Statistical Society. I made this statement at the suggestion of an honourable friend of mine sitting near me, who, while I was on my legs twice requested me to make this statement to the House." I may mention that I moved from time for returns which I propose to put in here.



(Chairman.) I think we have had all those already.

15,983. (Dr. Collins.) Will you give the Commission the number of the returns?—The first is Vaccination, Mortality. Return relating to births and deaths in England and Wales. Vaccination, small-pox, &c. in my name ordered by the House of Commons to be printed 14th of August 1877. The next was 1880, 2nd of September. Ordered to be printed. Deaths, England and Wales. Return relating to deaths in England and Wales. It is not quite of the same description as the other. Then there is another of the 25th of February 1880, this one is described as Mortality, General and Infant. Returns of general average of death-rate. Then the next is one obtained by Mr. Channing, M.P., dated the 13th of August 1888. That is a return of Deaths, England, and Wales.

Then I do not know whether it is strictly evidence, but I have summarised my objections to the Acts. I do not know whether I ought to inflict them upon the Commission, but I have some evidence to support each of them. I desire in closing to offer to the Commission some objections to the law compelling vaccination.

First, it enforces a varying medical theory. I quote in support of that Sir William Gull before the Committee of 1871, who when asked (Question 4741) as to the protection given by vaccination replied, "I should say that vaccination was as protective as small-pox itself." Dr. T. M. Rooke, of Cheltenham, writes to the "Christian World," of December 20th, 1883, "Vaccination, performed according to certain well-known rules, protects against small-pox for a number of years, but this number is variable, differing in different individuals." Dr. Warlomont, in the "British Medical Journal," November 12th, 1881, recommends vaccination, or repeated vaccination. Dr. Husband's Student's Handbook of Forensic Medicine, page 559, says, "Vaccination was once put forth as a perfect prophylactic to small-pox."

The proper view to take of vaccination appears to be this, that it does not prevent small-pox, but modifies its virulence." Sir John Simon, in "Papers Relating to Vaccination," says that when one is vaccinated with cow-pox derived from small-pox, "Neither renewed vaccination nor inoculation with small-pox, nor the closest contact and cohabitation with small-pox patients will occasion him to betray any remnant of susceptibility to infection." Dr. Buist, of Edinburgh, teacher of vaccination for the Local Government Board, in his "Vaccinia and Variola" (London, Churchill, 1887, page 121), says, of variolation, "Its value as an alternative proceeding in small-pox epidemics, when vaccine lymph cannot be obtained, is unquestionable," and in such circumstances "I believe it could be used quite as safely and freely as vaccine lymph." Then I object, secondly, that it overbears the opinion of the individual. Thirdly, it destroys the option of remedy. Fourthly, it interferes with parental control. In support of this I quote Sir Thomas Watson, in the "Nineteenth Century," June 1878, as saying, "I can readily sympathise with, and even applaud, a father who with the presumed dread or misgiving in his mind, is willing to submit to multiplied judicial penalties rather than expose his child to a risk so ghastly" as that of syphilisation. My fifth objection is that the remedy is speculative and indefinable. On April 1882 Mr. George Bone, of 54, Bagshot Street, S.E., asked the Local Government Board for a definition of the word "vaccination" and on May 2nd Mr. J. V. Rotton replied from the Local Government Board that the Board "cannot undertake to give the definition asked for." On December 24th, 1886, the following letter was sent to certain inhabitants of Oldham: "The Board are not empowered to give an authoritative definition of any term used in an Act of Parliament. The Board, however, may state that vaccination as ordinarily performed by Public Vaccinators and other medical practitioners, is such vaccination as is referred to in the Vaccination Acts." Then, sixthly, I object that it is in fact either wholly (a) ineffective, and therefore useless; for that I quote Dr. Cameron, a member of the House, in a letter to the "Times," in which he says, "The recurrence of a mortality almost as high as that experienced prior to the Vaccination Acts shows either that the protective virtues of vaccination are mythical, or that there is something radically wrong in our national system of vaccination." Dr. Ballard wrote in 1868: "Four years after the time when Dr. Jenner made the announcement of the protective power of the vaccine disease to the world he thus expressed himself: 'It now

"becomes too manifest to admit of controversy that the annihilation of small-pox, the most dreadful scourge of the human species, must be the final result of this practice.' Dr. Jenner's sanguine hope has not been fulfilled, experience has not verified his prediction; small-pox has not been eradicated. Let me add that scientific observation and reasoning give no countenance to the belief that it ever will be eradicated even from civilised communities." The "Lancet" wrote in 1871: "Those who have been building up in their imaginations a great and beneficent system of State medicine under which the great causes of disease were to be controlled must abate their hopefulness. It must be admitted that the existing system of public vaccination has been sadly discredited, and almost mocked, by the experience of the present epidemic." Dr. Seaton in "Public Health Reports, New Series," No. 10, page 51, says concerning the epidemic, 1871-74, "In every country attacked, so far as our information extends, the peculiar intensity of this epidemic was manifest by the extreme diffusiveness of the disease, by its attacking in unusual proportions persons who were regarded as protected against the disease, whether by previous small-pox or by vaccination, and by the occurrence with quite remarkable frequency of cases of malignant and hæmorrhagic type, and the consequent unusually high ratio of death to attacks." Mr. W. Gayton (Notes on Small-Pox, 1873) says: "Over and over again we have seen children and adults who have been vaccinated as a precautionary measure (small-pox, perhaps, having broken out in the house in which they were living) in whom three, four, and five good recent vaccine vesicles were visible, nevertheless the disease itself passed through the usual stage unmodified, and several fell victims to the attack." That extract is taken from the "British Medical Journal," July 17th, 1880. Or, (b) that at least it is uncertain, large numbers of the vaccinated and many re-vaccinated having succumbed to small-pox. Dr. Ballard says (page 95): "It is a matter of public notoriety that small-pox does occur even among those who have undergone the vaccine disease," and (page 97) "A person may have the true vaccine disease, and yet suffer from small-pox at a subsequent period of his life." Dr. Buchanan, writing on the present prevalence of small-pox in London (Report issued June 9th, 1881), records 325 deaths of the vaccinated. At Müller's Orphanage at Bristol, where all the children are vaccinated, of 748 inmates there were 292 cases and 17 deaths. At the Cologne epidemic, 1870, 173 vaccinated persons were attacked before any unvaccinated. At Leignitz (1871) the first unvaccinated was 225th on the list.

15,984. (Chairman.) Where is that to be found?—I cannot give the reference at the moment, but I think it has been already referred to. Then Dr. Reece, in the "Gazette of Health," volume 5, page 439, writes, "Cases of small-pox after cow-pox are become so common as no longer to excite any interest." The "British Medical Journal," July 5th, 1884, writes, "The great majority of those attacked by small-pox have been vaccinated, and, moreover, do not belong to either of the classes mentioned by the President of the Local Government Board," i.e., shifting and foreign population. My next and seventh point is that absolute safety, the sole justification for vaccination being made compulsory by law, though asserted by Jenner, by Poor Law Boards, and by ministers in Parliament prompted by the medical authorities, has been given up in the face of the evidence of the illness and death of many thousands by small-pox after vaccination and re-vaccination. My eighth point is that the device by being stamped with the authority of the law is received with undue reverence, is raised above scientific criticism or scepticism, is stereotyped as an irrefragable and final attainment of research. My ninth point is that the effect of such a law is shown in the desire to save vaccination from the reproach of the death of infants, in the endeavour to find some other cause of death than the most likely; in the setting up of "erysipelas" as the cause when this is admitted to be a probable consequence of vaccination; finally by the practice of giving untrue certificates of the cause of death. In support of this, I may say that Mr. Henry May, Health Officer to the Aston Union, Birmingham, has already been quoted by Mr. Biggs. A Leeds coroner, according to Mr. Peter Taylor in the debate on Animal Vaccination already referred to, "declined to take as a verdict that the child died from vaccination, and

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"said there was no such thing known to the law as "death from vaccination." The "Lancet" of August 21st, 1880, reported an inquest at Hartlepool of an alleged death from vaccination, at which Dr. Swanwick said "death was due to syphilis from inoculation." The editor in a note to a letter on the subject wrote, "It is much to be regretted that medical men should "lend themselves to the purposes of anti-vaccination "agitators." In 1882, at an inquest at Holloway, before Dr. Danford Thomas, the verdict was "Death "from shock to the system following vaccination." Dr. Wagstaffe said in his evidence, "If the child had "been vaccinated in two places instead of four then "death would probably not have occurred." On this the "British Medical Journal" remarks, "It is much "to be regretted that a qualified medical practitioner "should lend himself in any way to the outcry against "vaccination." Dr. Brudenell Carter is thus reported in the "Lancet" of June 13th, 1868: "I am quite "aware that there is now a sort of common consent "among medical writers to gloss over the evils that "may be attendant upon vaccination for the sake of "its great and manifest benefits." Then I say, tenthly, that the necessary endowment of officers out of the public funds must have a tendency to lay to sleep medical doubt, so necessary to promote and animate scientific inquiry. My eleventh point is that it compels an unwilling parent to do what he believes injurious, and what is, in fact, poisonous to his child, and this in the face of two uncertainties: (1) Whether, if unvaccinated, the child would have small-pox. (2) That if he does, vaccination will protect him. My twelfth point is that it compels the inoculation of matter, the origin and nature of which are not ascertained: whose effect is mostly painful, and is even dangerous and fatal. Dr. Ransome, Professor of Public Medicine at Owen's College, says, "May I express an "earnest hope that the renewal of our lymph supply "may, if possible, be obtained from genuine cases of "cow-pox, and not from calves or heifers inoculated "from others, or worse still vaccinated from a human "subject." My thirteenth conclusion is that medical opinion differs as to what cow-pox is or when or where it can be found. In support of this I say that Mr. George Fleming, LL.D., in "Human and Animal Variolæ," writes of "the grave fallacy that vaccinia is only human "variola." The "Lancet," 10th January 1885, says "that vaccinia and variola are one and the same "disease . . . has no substantial support in "experience," but wrote the previous August "that "experiments by Ceely and Badcock and by other "late observers had clearly shown that vaccinia and "small-pox are one and the same disease." Dr. Bristowe in his "Treatise on the Theory and Practice of "Medicine," 1880, page 162, writes of cow-pox or vaccinia, and concludes the paragraph thus: "It seems "clear, therefore, that cow-pox is small-pox modified "and deprived of its virulence by transmission "through the cow." This, Dr. Pavey says in his Harveian Oration, "may be regarded as an accepted "conclusion." Mr. Fleming in a long letter to the "Lancet," dated November 8th, 1886, controverts Dr. Pavey's dictum, reaffirming that small-pox and cow-pox are "different and antagonistic diseases," signing his letter as Principal Veterinary Surgeon to the Army. Dr. Charles West in his "Mother's Manual" agrees with Dr. Pavey. My fourteenth conclusion is that medical science has failed to account scientifically for the existence of a disease of the kind called cow-pox as incidental to the female animal only. In support of this I say that Professor J. B. Simonds, Principal to the Royal Veterinary College, contended "that the existence of cow-pox had to be proved; "it never had been proved . . . he did "not believe that any form of variola belonged "to the bovine race." Dr. J. L. W. Thudichum, President of the West London Medical and Chirurgical Society, says that vaccination is now carried on by three varieties of lymph, viz., "(1) Humanized cow-pox; (2) such pox transferred to the calf and then "from calf to calf and from calves to man; and (3) "lymph from cows which have been inoculated with "human small-pox." Mr. John Morton, M.B., L.R.C.S.E., of Sydney, teaches that cow-pox is caused by the several poisons of flies which inoculate cows' teats on which they alight attracted by the milk. My fifteenth conclusion is that the law is inconsistent, in one and the same statute forbidding the inoculation of variolous matter and yet permitting the inoculation under the name of vaccination of matter derived from small-pox inoculated in cows.

15,985. (*Chairman.*) Does that strike you as a very strong reason? Is not the reason against inoculation of variolous matter that it was found by experience that it did not merely produce an effect upon the subject inoculated, but that it conveyed disease to other people?—I think there is evidence to the other effect also.

15,986. That vaccination conveys the disease to other people?—Yes, to some extent.

15,987. You would not consider that was true to the same extent, would you?—I do not pretend to any specific knowledge of these points. This is what I am referring to. Dr. Jules Guérin told the French Academy of Medicine that he considered "a crowd of the "newly vaccinated to be in itself a dangerous centre "of infection, and the 150,000 re-vaccinations in Paris "during the siege to be in some degree responsible for "the great epidemic of 1870-71." My sixteenth point is that medical authority has insisted that cow-pox and small-pox are identical. If it be urged that medical opinion has altered in various particulars and is only progressing, it may be averred with certainty that if Parliament had been aware that the specific was not certain, and that medical knowledge was not complete on the subject, it would not have sanctioned compulsion. In support of that I may say that the report on the present state of vaccination made at the request of the Provincial Medical and Surgical Association in 1839 by a committee of 28 duly registered medical men, of whom Dr. Baron was chairman, stated, "The vaccine disease is not the preventive "of small-pox but the small-pox itself, the virulent "and contagious disease being a malignant variety." Dr. Harman, principal physician at the Imperial Hospital, Vienna, from 1858-64, said, "I am convinced that "vaccination is the greatest mistake and delusion of "the science of medicine; a painful illusion in the "mind of the discoverer: a phenomenal apparition "devoid of scientific foundation, and wanting in all "the conditions of scientific possibility." Dr. R. Brudenell Carter, in the "Lancet" of June 13th, 1868, writes: "The positions alike of the public and practi- "tioners have been changed for the worse by that "aggregate of useless, meddlesome, and mischievous "legislation known as the Vaccination Acts. That "vaccination will be increased or small-pox diminished "I for one utterly disbelieve." My seventeenth conclusion is, it is admitted that there are no means of distinguishing "good lymph" from "spurious lymph" or "dangerous lymph" and "deteriorated lymph." My eighteenth point is that medical science has not ascertained that danger to the human constitution may not arise from animal contamination. The "Lancet," June 22nd, 1878, says, "The notion that animal lymph would "be free from chances of syphilitic contamination is "so fallacious that we are surprised to see Dr. Martin "reproduce it, and so contribute to the perpetuation "of the fanciful idea which too commonly obtains on "the origin of vaccine syphilis." My nineteenth point is that the proneness of cattle to tuberculosis and the possibility of the inoculation of tuberculosis are not contested. Then as to vaccine tubercle, "What produces tuberculosis is tubercle; what fails "to produce it is not tubercle." That is from Coln-heim, 1880. Wilson Fox has shown that vaccine lymph produced tuberculosis in a guinea-pig. The experiment was repeated four times; in all with fatal success; post-mortem found tubercle "intense and typical." It has similarly been communicated to hens. M. Toussaint vaccinated different animals with lymph from a tuberculous cow. They all became tuberculous. I think that Dr. Klein's experiment may be added within the last week or so. The "Medical Times and Gazette," of September 3rd, 1881, referring to this matter, says, "It would seem in consequence that the dangers of "animal vaccination may be greater than those of "human which are supposed to be avoided by having "recourse to the cow." My twentieth point is that it is proved that syphilis and skin diseases have been inoculated by vaccination. My twenty-first point is that the Legislature has not defined the vaccine permissible, and the authorities have added calf lymph, which is not limited to the female, and is therefore not cow-pox as previously understood. My twenty-second point is that calf lymph is more inflammatory and more attended with constitutional disturbance than the ordinary cow-pox, and has never been specially tested as to its protecting power.

15,988. (*Chairman.*) What is your authority for that, because that is not the universal belief; Dr. Cory, who



has had large experience upon the matter, said it was not so?—[I have read to-day the answer given to me by my honourable friend in the House of Commons, that it caused more constitutional disturbance.

15,989. There does not seem to me to be an absolute agreement upon that, because, I think, Dr. Cory's evidence was that he did not draw that distinction?—I do not say that it is agreed. I venture to say that it is alleged and stated and not disproved. I thought I had excellent authority for it.

15,990. (*Dr. Collins.*) In answer to Question 4491 Dr. Cory says: "My impression is that you get more 'sore arms after using calf lymph than after using 'humanised lymph'?"—Dr. Seaton in his hand-book (this is one quotation I made in regard to this) at page 337 affirms that Ceely says that "so far from 'being likely to produce fewer ailments and cutaneous 'eruptions in the predisposed he knows from his experience that it would, as being more irritating, 'produce more.'" Mr. J. H. Bogle ("Lancet," 3rd April 1880) in reference to two cases of calf lymph vaccination says he has "never seen from ordinary 'lymph so severe an attack of erysipelas." My twenty-third point is that the medical profession are not agreed as to the number of marks which shall be satisfactory evidence of "successful vaccination." Dr. Jonathan Green (On Diseases of the Skin, page 125, London, 1835) agrees with Jenner that a single puncture will prove as effectual as 20. The "British Medical 'Journal" insists on four marks. Dr. R. J. Lee, physician to the Children's Hospital, advocates "one 'point only." The Government fixes four marks. My twenty-fourth objection is that the forcing of parents to bring babes to and fro two or three miles in all weathers to be vaccinated, and again in a few days to be inspected, involves anxiety and loss to the parent

and risk to the child. My twenty-fifth is that the treatment of the conscientious parent committed to prison because he cannot pay the fines on the same footing with thieves and criminals is outrageous. My twenty-sixth and last point is that extra payment to the Public Vaccinators for doing their duty beyond the amount the Legislature has judged sufficient is peculiar and indefensible. It has the effect of directing their attention not to the care of the health, but to the securing such effects as shall make their diligence incontestable.

(*Chairman.*) Dr. Cory was asked at Question 4360: "In your case you do not find that amongst the infants 'vaccinated with your calf lymph there is greater inflammation or greater tendency towards untoward 'results, such as ulceration, than with humanised 'lymph." What he says is that there are cases but he thinks those were the cases of Warlomont's lymph which has been taken too early.

15,991. (*Dr. Collins.*) Will you refer to Question 4491 where Dr. Cory was asked: "The same directions are 'not issued in the case of humanised lymph." To which he replied: "Yes, the same directions are issued, 'but there has not been the same care in registering 'the cases; but my impression is that you get more 'sore arms after using calf-lymph than after using 'humanised lymph'?"—I asked the question repeatedly in the House of Commons, and was always told that the Local Government Board were obliged to admit it.

15,992. (*Chairman.*) But the fact is very few people have really had the means of comparing the two?—That is one objection we have to the authorities enacting it. That I think is all I have to say to the Commission.

The witness withdrew.

Adjourned till Wednesday, 27th instant, at 1 o'clock.

## Sixty-sixth Day.

Wednesday, 27th May 1891.

PRESENT:

The Right Hon. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary.*

Mr. JOHN THOMAS BIGGS further examined.

15,993. (*Chairman.*) I want first to get a few particulars from you as to how these statistics have been arrived at with regard to the information which we have subsequently obtained by an inspection of the books; but first of all is this correct: that in these earlier years, say 1849, 1850, and onwards, you have deducted one-fourth of the total number of vaccinations, and you have added one-fourth of the total number of vaccinations in the succeeding year?—Those deductions and additions were made in the Table A., put in by Mr. Chamberlain, but they affect only the public vaccinations.\*

15,994. Because the year at this time ended the 29th September, and that was with a view of, as far as

possible, roughly making them correspond with the subsequent years?—Yes, that is so. It has been done with a view of making the vaccination years all begin and end alike with the same dates, that is, from the 1st January to the 31st December of each year.

15,995. But now take this first year 1849; you arrive at a total of 1,549 vaccinations by the Public Vaccinator. Will you look at this paper and say if that is the document from which you have obtained your figures?—That would be the document, I presume, from which Mr. Chamberlain took his figures, a copy of which he afterwards supplied to me.

15,996. The one-fourth; the sum to deduct from the 1,441, which is the figure given in this paper as the vaccinations for the year ending the 30th of September 1849, would be 360, would it not?—Yes, it would.

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\* The vaccination figures referred to in this day's evidence, Questions 15,993-16,982, were those previously handed in by Mr. L. P. Chamberlain, for which he was responsible.—J. T. B.



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15,997. Now take the next year, you have to add a fourth of that year?—Yes, of 1,051.

15,998. That would be 262, would it not?—Yes, about that number.

15,999. That is, from 1,441 you deduct 360 and add 262, that makes a total of 1,343, whereas your total is 1,549?—I have not the sheet with me upon which the figures were cast up, and I really cannot now say from memory exactly what the figures were.

16,000. Then if you take the next year (I do not know how it has come about) the total put down for the next year is 1,051?—That is for the year 1850.

16,001. The one-fourth off that is 262 to be deducted, the amount to be added is a fourth of the next year; what is the total for the next year?—The September total of public vaccinations is 982.

16,002. That would be 245?—Yes, 245 and a little over is a quarter of the 982.

16,003. That would make a total of 1,034 for the year?—It would, after deducting 263 from the 1,051 and adding 245 it gives a total of 1,033 public vaccinations for the year 1850 ending with December.

16,004. Whereas you have, on your Diagram A., 1,708. That has a double effect upon your figure, because you arrive at the private vaccinations by dividing the public vaccinations by five, therefore the error, whatever error there is in the number of public vaccinations, is intensified in the whole of the vaccination registers, because it is carried on to the private vaccinations?—If there be an error in Mr. Chamberlain's figures for any one year it would not affect the whole of the vaccination registers, because it would only influence the figures for the year in which the error occurred, and the preceding and succeeding years. However, I would just refer you for a moment to these papers which are abstracts from the registers. They give the whole number of Vaccinations apart from whether they were public or private.

16,005. Those are the later ones, are they not; at that time you could not get them, could you?—We had the registers complete right back to 1862 or 1863, but these abstracts of mine go back to 1853.

16,006. I thought your private vaccinations were only an estimate at that time?—The private vaccinations for a few years were estimates, in part; but then we have the complete registers for some of the earlier years, and here are the figures abstracted from those registers.

16,007. Why did you not give them instead of an estimate, if you had them?—I have given all the figures supplied to me for the years where we could actually arrive at the number.

16,008. But those do not apply to the years I am dealing with, namely, 1849 and 1850?—No; they do not apply to those years.

16,009. Then I want to understand it for the other years. Take, for example, the year 1871, you have got on your Diagram A. the total number of public vaccinations as 2,764; do you arrive at that by adding together all the vaccinations that there were in that year, or the vaccinations of children born in that year?—First of all we have taken the total number of vaccinations from the vaccination book, which was 3,736; then the Vaccination Officer himself has gone through them to abstract the private vaccinations from the public vaccinations and so makes the division.

16,010. I do not think you follow me. There are 2,764 public vaccinations. Is that number arrived at by adding up the total number vaccinated by the Public Vaccinator in the year, or is that limited to those who were born in that year?—It is limited to those who were born in 1871, or more strictly speaking to those whose births were registered in that year.

16,011. You do not know the total number vaccinated in that year?—No: I asked the registrar if he could supply me with the actual number of *primary* vaccinations for each year, apart from considerations of age, as I considered this would be a fairer—and indeed the only absolutely correct—method of dealing with the question. But he told me at that time that they could not be ascertained, and that the figures with which he had supplied me were returned according to the usual and official mode of distribution. So that there might possibly be a few vaccinations beyond this number of 3,736.

16,012. But on looking through the register one finds constantly that there are a considerable number vaccinated who are not born in the year?—In the earlier registers you might find that, but you would not find many at this date, I think.

16,013. I think we do, even in the year 1872?—I know that it has been the practice in the earlier registers to enter up in the middle or at the end of the books the vaccinations of a number of children of six or seven years of age.

16,014. I am not speaking of those. What we are told is this: that if a child born in 1868 was vaccinated in 1871, its vaccination would appear in the register for 1868, although it was vaccinated in 1871. Now what one wants to know is the facts we are dealing with; does the 2,764 represent the number of vaccinations performed in the year or only the number of vaccinations performed upon children born in that year?—It is the number of public vaccinations performed upon children whose births were registered in that year.

16,015. Then there may have been in that year a number of vaccinations beyond what appear in that number there?—There might have been a few more vaccinations of children born in previous years, but if so, one year would compensate for another.

16,016. (*Mr. Meadows White.*) As far as possible you looked back in the registers and put the vaccinations against the births where you found them correspond?—The Vaccination Officer has done so year after year; but the returns that we have here from 1868 refer only to children born within the year.

16,017. (*Mr. Picton.*) In all cases there were rather more vaccinations in the course of the year than there are shown in these figures?—On the whole there would be rather more vaccinations than are shown here.

16,018. (*Chairman.*) But the point is not the number only, but their distribution—when they took place. In the early returns the figures represent the number vaccinated within the year, and without reference to when they were born?—That method would cease in 1867.

16,019. I see that in the year 1849, for example, the number vaccinated above one year old was not very far short of the number of those vaccinated under one year old?—That may be so for 1849, but I think you will find on the medical papers to which you are now referring that for some of the years there are very few over one year.

16,020. In 1852 there are successful public vaccinations, 763 under a year and 599 over a year?—I have no copies of the papers from which your Lordship is now quoting, but that would be a very large proportion for that one year. In some years you will find it much smaller. The reason why that might occur in the year 1849 is because previous to 1849 very few vaccinations had been registered. We get an indication of the number of public vaccinations in 1844 and 1845 by the coloured columns that are shown for those odd years on my Diagram A.

16,021. But even when you come to 1858 there is something like a fourth of the number of those vaccinated above one year who were vaccinated under one year. Then when you come to 1861 there were 1,092 under one year and 323 above one year; in 1863 there were 910 under one year and 311 over a year; but that would cease in 1867?—Yes, to a very large extent it would cease in 1867. After this date by far the larger proportion of vaccinations would be those of children under one year of age.

16,022. (*Dr. Collins.*) That was at the time of the appointment of the Vaccination Officer?—Yes, at the appointment of the Vaccination Officer in 1868, when a different system of registration came into operation.

16,023. (*Chairman.*) Take the year 1871, for example; you will have there the vaccinations of all those who were born in the year 1871, some of those vaccinations might take place in 1872 or 1873 or 1874?—Yes, possibly some might not be vaccinated until 1874.

16,024. Are they included in your 2,764?—Of the births registered in 1871 only those vaccinations would be included which took place prior to the 30th of June the following year; or, in a further supplementary return, up to February of the year 1873.

16,025. I understand that; but you have not included those who were vaccinated though they were a year



old?—Not there perhaps, because it would partly depend upon the date of their registration.

16,026. Did you take them out because they were not in the register?—For the earlier years the numbers were read out to me from the register by the Vaccination Officer.

16,027. With the ages?—He began with the register of births from the 1st of January to the 31st of December; he read out the vaccinations of those whose births were registered during the year.

16,028. (*Dr. Collins.*) I understood from the Vaccination Officer that in the case of the vaccination of children of more than one year, which could not be referred to their proper year, those vaccinations were lumped together at the end of the book?—After 1871 they were, but before that date they were lumped together either at the end or somewhere in the middle of the book.

16,029. And I suppose they were dealt with separately?—Yes, in the registers.

16,030. (*Chairman.*) But all the vaccinations which could be referred back to the previous years were entered back in them?—Yes, the Vaccination Officer stated that they were. I might explain that from 1872 onward the register was kept by the Vaccination Officer himself, and the whole of those registered as vaccinated refers only to the children whose births were registered within the year and those of them who were vaccinated up to the 30th June in the succeeding year or six months later still. Prior to that time the register was kept in a different way.

16,031. I did not so understand him; I understood that if a child born in 1872 had been vaccinated in 1876, it would be now registered under the year 1872?—Yes, but that would not appear on my Diagram A. at all.

16,032. Why not?—Because the principal return would have been previously made and sent up to the Local Government Board, and although these later vaccinations may be entered up in the books they would not appear here if entered subsequent to the despatch of those returns to the Local Government Board. Neither do they appear in any official returns.

16,033. You mean that in those subsequent years your figures are not taken from the books, but from the returns sent up to the Local Government Board?—Yes.

16,034. (*Dr. Collins.*) The Vaccination Officer, in answer to Question 15,959, stated that “after the ‘returns have gone to the Local Government Board there is a supplemental report, but there would be no alteration after that.’ That would not be included in your figure?—Not after the supplemental return referred to by the Vaccination Officer; but the numbers in that supplemental report are included in my figures.

16,035. (*Chairman.*) When would that begin; because one must see exactly when the different modes of estimation began. From what date would they be taken, not from the books but from the returns sent to the Local Government Board?—I think I am right in saying that this method would begin in the year 1871. However you would be able to get that from the registers you have here. First of all there are what are called vaccination registers, and then they are followed by what is called the vaccination books.

16,036. (*Dr. Collins.*) Have you had access to the supplemental reports dealing with cases in which the vaccination is registered subsequently to the 30th of June in the next year?—No, but those latest supplemental reports would contain only very few vaccinations indeed.

16,037. They do not go into your table?—They do not go into my table, and even if they did their effect on my figures would be inappreciable.

16,038. And if anything they would effect a slight addition?—Yes, if anything they would effect a slight addition, as I have always maintained; the Vaccination Officer's returns were ordered to be printed by the Board of Guardians; and I have taken that printed return as the basis of these figures from 1873 inclusive.

16,039. (*Chairman.*) Are your births the births of the year, or the births registered in the year?—The births registered in the year.

16,040. If a child was born in December and registered in the following January; it would appear in the following year?—Yes, its birth would be counted

in the year of its registration. It is rather difficult in these registers to find just where the year begins and where the year ends with the vaccinations, but I believe Mr. Maskell has got it as nearly as possible. Under any circumstances if there were a few left out of one year they would be included in the next, one year, therefore, corrects another.

16,041. You have not included in any case those entries of vaccination which occur at the end of the book, or which occur otherwise than in their order of birth?—No, I think not, but I should have to examine the registers to settle this point. Perhaps this paper would throw a little light upon the subject. The registers which I see your Lordship has before you were called over to me by the Vaccination Officer, and the number from each register was entered on these papers and then the numbers were totalled up for each year. So far as my understanding went they related only to the registered births in each year, and then from that total number, abstracted from the registers, the numbers from the papers which you have in your hand were deducted, being the public vaccinations; the remainder shows the private vaccinations; and that process would apply from 1849, including those calculations right up to the year 1867. So that the dark coloured red upon my Diagram A. would represent the figures after adjustment found upon the paper that you have before you.

16,042. (*Mr. Picton.*) Is it not the case that each of those figures represents as nearly as could be ascertained the precise number of children registered as born in that year and primarily vaccinated in that year?—That is so, from 1868.

16,043. Only from 1868?—From 1868 to the present time. Prior to 1868 I do not think that principle would strictly apply, but it would generally, and it is as near as we could get it from the registers.

16,044. On which side is there any probable error, on the side of deficiency or excess in the number of vaccinations?—On the side of deficiency; my figures would rather be below than above the actual number vaccinated.

16,045. (*Chairman.*) Not necessarily in any given year, would it?—Taking the whole of them it would be so.

16,046. But if we are comparing year by year it would not necessarily be defective in the whole series of years. You might have a deficiency in any one year made up afterwards?—That might be so, and your Lordship's suggestion corroborates what I have previously stated.

16,047. (*Mr. Picton.*) But still, taking the whole of the figures, what you say would apply?—Yes, and the deficiency would be even more evident if we remember that there are no re-vaccinations included.

16,048. From 1867 there would be supplementary vaccinations which do not appear here; that is to say, vaccinations of children born some years before?—Yes.

16,049. They would not appear?—No, not on my diagrams or in the tables, nor in any official return.

16,050. They would have to be added to get the true number?—Yes, but they would be very few from 1868 to 1877, because the majority of the births were accounted for as vaccinated.

16,051. Then in each of those years there will be more vaccinations than are accounted for in those figures?—Rather more; but those returns showing these would not be sent to the Local Government Board subsequently to what is called the final supplemental report.

16,052. (*Sir Charles Dalrymple.*) You say that you have no account of re-vaccinations. You say there might have been cases of re-vaccination which might have increased the number?—Yes, a few.

16,053. Then if they have never been taken into account in any case it does not affect the calculation at all?—It does not affect these figures; but assuming that re-vaccination is “protective” the same as primary vaccination is supposed to be, what I want to make clear to the Commission is that I have shown the minimum rather than the maximum number of vaccinations performed.

16,054. But I understood you to say in answer to Mr. Picton that the probability was that the number was greater, because there may have been cases of re-

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vaccination. Now if you have never taken re-vaccinations into account at all I do not see the data upon which you maintain that the number was probably greater than is stated?—The number of primary vaccinations would be likely to be greater than the number returned from the year 1868, but before 1868 I do not think it would.

16,055. Have you any other reason to give for your belief that you have been understating the numbers than that which you stated just now, namely, that there may have been re-vaccinations?—Yes. We know that there were no subsequent returns sent to the Local Government Board of those vaccinated after the expiration of the usual period allowed for the last supplemental return—Mr. Maskell stated so, I believe, when he was here; and I have at least understated the vaccinations by that amount.

16,056. (Mr. Bright.) But that does not mean that those were re-vaccination returns; what you mean is that there were vaccinations subsequently performed on children which had been postponed longer than the legal time, which did not come into your figures because they were too late?—Yes, it was so in respect to all vaccination returns.

16,057. But you were not referring to re-vaccination at all?—No, we have taken no account of re-vaccinations.

16,058. (Chairman.) Take the year 1864; in the year 1864 you put the public vaccinations at 1,196?—Yes, that is Mr. Chamberlain's figure.

16,059. Do you say those returns include both public and private vaccinations?—No; that figure includes only the public vaccinations.

16,060. If you take the year 1864, I find for the year ending September 1864, under one year of age, 2,177 vaccinated; if you take a fourth off that, that still would leave 1,600?—Your Lordship is now quoting from another paper, the medical returns, I think. But you are omitting the total, are you not?

16,061. The total what?—In the medical returns—which are entirely distinct from the vaccination registers—the total number of vaccinations is given in the last column.

16,062. I am taking the number vaccinated under one year, 2,177—above one year 3,676, total 5,853?—I have no copy of those details. But from that total of 5,853 the numbers which have been abstracted from the vaccination registers have been subtracted, and this gives the normal number which had actually been vaccinated within the year. The remainder or excess number is accounted for by the note which you will see at the bottom of the diagram—3,928 extra vaccinations performed at the public expense, which are shown in a footnote upon Diagram A.

16,063. Supposing you take the 3,900 from the 5,800 that leaves 2,000; but I am not sure that I understand why you deduct 3,900 in that particular year?—In those registers which lie upon the table we have the vaccination record for each year, and after going through the year 1864 it was found that there were a certain number of vaccinations performed in that year. These which are the normal vaccinations for the year are deducted from the abnormal total number you have upon that sheet, which gives the Public Vaccinator's returns, and the balance shows the "Extra Vaccinations" which have taken place above the number of the current year's vaccinated births.

16,064. What I want to call your attention to is this, that of those vaccinated under one year old in that year there were 2,177; why should any of those be deducted? Under one year must be the normal vaccination of the year, must it not? Why should any of them be deducted?—It would not necessarily follow because they are put down there as under one year that all the children *must* have been born in that year; for, as a matter of fact, however improbable it may appear, it would have been possible owing to the system of registration for all the vaccinations in any one year to be those of children under one year of age; and yet for none of their births to have been actually registered within that year. But on the paper from which your Lordship is now quoting the returns are made up to September 29th instead of December 31st. Therefore a quarter of them would have to be deducted because they took place in 1863.

16,065. That leaves you 1,600. Then to those have to be added a fourth of those which took place the next

year, which would make it about 1,850; I cannot understand how you arrive at your figure of 1,196?—Those figures were prepared by Mr. Chamberlain, and I suppose he knew how he was dealing with the matter.

16,066. But we want to know how you arrive at your figure?—I have already explained how that was arrived at. The whole of the public and private vaccinations are taken from the registers (and they cannot possibly be more than those that took place within the year) and are used as a concrete number which is subtracted from that abnormal number of 5,853 which your Lordship found upon the medical sheets.

16,067. That year the number of registered births was 3,092, therefore you might have had 3,092 vaccinations without exceeding the births; now, seeing that in that year you have 2,177 vaccinations within the year of children under one year of age, I cannot understand how you reduce that number to 1,196 by any process of getting rid of what was extraordinary and abnormal, dealing always with only public vaccinations, which were 2,177, as I understand?—The whole of the vaccinations on the sheets to which you are now referring are by the Public Vaccinator, and those arrived at from the registers are deducted from them.

16,068. Could you show the Commission how the 1,196 is arrived at in detail—what figures it comes from, because I cannot at present understand how it can be accurate?—Not having the details before me I cannot say exactly how Mr. Chamberlain has arrived at it; but the figures were abstracted from register No. 21 and register No. 22.

16,069. When you say "abstracted" figures, what do you mean by abstracted figures—what figures do you take out? Moreover, No. 21 appears to be unfortunately amongst those which have not been brought to us?—The books that lie before you record five births upon each side, that makes a total of ten upon each double page, and they are recorded as either vaccinated or unvaccinated. The numbers on each of these pages are abstracted and cast up, and the total number thus found to be registered from the 1st of January 1864 to the 31st of December 1864 was subtracted from the number, 5,853, that you have upon those sheets and the remaining number is the 3,928, which our Registrar denominates "Extra Vaccinations" performed within the year.

16,070. (Sir Edwin Galsworthy.) Could not you hand in a statement showing exactly the process adopted to arrive at these figures?—Yes, I could do that, and I will do so if the Commission desire.

16,071. (Chairman.) A statement showing what you took, what you deducted, and what you added, and how you arrived at the total?—Yes, I will do that. I will carefully examine the whole of Mr. Chamberlain's vaccination figures.

16,072. Does it not strike you as strange that you should arrive at the conclusion that all vaccinations over the 1,196 are extra, because if you confine the vaccinations to those under one year you have a number considerably in excess of the 1,196, whereas some at least must have been over a year?—This arises from taking the figures from the vaccination register and also from the Public Vaccinator's returns, which proceed upon totally different lines. Of course in regard to the observation you now make as to the number under one year it does seem remarkable, and I will look more closely into the question.

16,073. (Dr. Collins.) Mr. Chamberlain, in answer to Question 15,809, said: "If you look at the year 1864, the total vaccinations in the third column are shown as 1,925 on my Table A.; that is the actual number counted up from the vaccination register, but in the medical officer's return to the Local Government Board there were 5,000 and odd persons vaccinated in that year." That seems to imply that there were vaccination returns other than the ordinary vaccination register?—That is so; and this system of making double returns adds to the intricacy of the question. Those returns which his Lordship has before him, and which are made out periodically by the Public Vaccinators or medical officers to the Board of Guardians, are entirely distinct from the vaccination registers.

16,074. (Chairman.) But this very thing is signed by Mr. Chamberlain himself?—I think that would be Mr. L. P. Chamberlain's father—it would be Mr. B. G. Chamberlain.



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16,075. (*Mr. Bright.*) Is he not living?—No, he is dead; but his son, Mr. L. P. Chamberlain, the present Superintendent Registrar, used to help him before he was appointed clerk to the Guardians. The better plan will be for me to prepare a statement of my own showing from what the figures are derived; but that would not be necessary from 1868, would it?

16,076. (*Chairman.*) No, I think not?—Because they are printed and forwarded to the Local Government Board; but I take it that you mean prior to 1868?

(*Chairman.*) Yes.

16,077. (*Mr. Pilon.*) You might take the year 1864 specially?—Yes, I will do that as it is a year requiring special consideration.

16,078. (*Chairman.*) In 1866 there seems to be something deserving of attention. In 1866 the total number of public vaccinations given is 1,060; one fourth deducted from that is 265 off; then if you add a fourth from the next year, which is 1,445, that would add 361, making a total of 1,156, whereas your number is 1,356?—You make 1,156 for public vaccinations.

16,079. Yes; whereas your number is 1,356, showing a difference of 200. Would you also look into these figures and see how that arises?—Yes, I will do so. Possibly the registrar has made a clerical error.

16,080. (*Dr. Collins.*) You were asked whether there may not have been re-vaccinations over and above the vaccinations paid for out of the poor rates. I suppose there must have been re-vaccinations?—Yes, no doubt there have been some.

16,081. And in the year 1871 those re-vaccinations were pretty numerous, were they not?—I am not sure about that, but I believe they were, more particularly in 1872.

16,082. (*Chairman.*) Now is there any other year than 1864 in which vaccinations have been deducted as being extra vaccinations?—No other year. Before resuming my statistical evidence there is one little matter that I wish to refer to in relation to some questions that were addressed to me by your Lordship upon the 29th of April in regard to Mr. Payne. If your Lordship will kindly refer to the list of imprisonments, with which the Commission have been furnished, Nos. 237 and 238, you will find that Payne's name is entered there, and that he was fined two fines of 10s. each or five days' imprisonment, and a little lower down, at No. 653, he was fined again 10s. or seven days. I think that clears up the point you mentioned to me. It substantiates the statement I made, with this exception, that the double imprisonment took place before the single one.

16,083. Were those both before the return?—Yes, both imprisonments occurred before the return was published; the parliamentary return is dated 1881 and the second imprisonment was in 1878.

16,084. What is the next point to which you wish to direct attention with regard to the statistics?—There is one matter which was named by Mr. Hutchinson when I was here before, which I would beg leave to direct attention to first. Mr. Hutchinson asked me if I would get some further information respecting case No. 177 of my list of injuries and deaths, the case which I referred to as a probable instance of syphilitic contamination. (*See Appendix III., page 428.*) I sent down to make inquiries—I was unable to go myself—the people had removed, but we found them at the changed address. The father, who formerly gave the principal part of the information, is now dead; he died in September last; the stepmother is living, and she attested to the general facts of the case, but was unable to give the details which the father had done previously; but from her further description she said the vaccination sores spread like big gatherings, and were very nasty and bad smelling, on the head and behind the ears, and the hair had to be cut off. The child was ill more or less for about 14 years and sometimes suffered fearfully. Her husband believed it was a case of the bad disorder. He was exceedingly bitter about it, and he used to curse and swear because the child had been vaccinated. This is all the information we can get about that; but I questioned Mr. Smith, my messenger, as to what the father told him, and the impression created upon his mind was this: that in the belief of the parent it really was a case of syphilis.

16,085. (*Mr. Hutchinson.*) There is no medical evidence at all; it is simply the belief of the father of the child that it was syphilis because the child had some eruption

which lasted several years?—Yes, and on account of the character of the eruption.

16,086. There is no medical opinion about that?—I am unable to say what medical opinion the father might have had.

16,087. You have no knowledge or belief that he had any?—I have no knowledge that he had any. I also made inquiry respecting the other cases, if you would like to hear the information. One child, No. 196, was vaccinated at ten months old, the mother having put off the vaccination for a time because, as she said, she did not want the child "spoiling." This was a case in which the child was said to have died of "Devouring Wolf"; the arm had literally rotted away, the flesh was eaten off under the chin, neck, mouth, and nose, all the way up to the eyes. The parents always said it was the "foul disorder," and they attributed it to vaccination. The child was vaccinated at school from another child, a beautiful-looking baby, but it became ill, and was ill for six weeks and three days, and died December 27th, 1871. There was another case, No. 174, which I referred to. We found the parents, but they had removed; the father was away from home; the mother stated that the child was ill directly after vaccination, and as soon as the arm healed eruptions broke out on the body, and the smell was fearful; the discharge saturated the pillow every night. The bad smell made others in the family ill. The mother was inoculated in the cheek through nursing the child and had a very bad face. There was some difficulty in making further inquiries about this on account of the father being away, as it was rather a delicate matter to enter into.

16,088. There was no medical evidence even there?—No, unless the parents had some which they did not name. Then there was another name at the end of the list—Wilkinson. I have a letter here which was sent to me by Mr. Wilkinson.

16,089. (*Mr. Meadows White.*) What number would that be?—No. 236. The memorandum sent to me by the father states that the child was inoculated with syphilis. Mr. Wilkinson sent me this memorandum upon the 1st of May 1891.

16,090. Who is Mr. Wilkinson?—The father of the child, and he who gives the information. He says, "In the interests of humanity I beg to inform you that I have been a sufferer by the prevailing practice of vaccination. I had a boy vaccinated, and although previously he was a fine healthy child, after the operation he was a great sufferer from cutaneous disease nearly 20 years, and then took small-pox, succeeded after an interval by fever, from which he ultimately recovered. Since then his health has been fairly good; but his prospects through life are ruined, as he could not be educated, could not be sent to a proper school; he was not expected to live to manhood, and his weight, which ought to be from 10 st. to 11 st., is only 7 st. Our next child was murdered outright, being contaminated with a horrible disease from which he died after a few months of suffering, rotten and wasted. In both cases the best-known remedies were prescribed and applied." I knew Mr. Wilkinson and have known him for more than 20 years, and I have heard him speak of this case many times.

16,091. (*Mr. Hutchinson.*) Those would be two brothers in the same family, surely?—Yes, they were.

16,092. And at quite different times they suffer from skin disease in consequence of vaccination?—Yes; but the parents were perfectly healthy then, and are so even now.

16,093. But here are children who get similar results from vaccination, but at different times and at quite different vaccinations, they both get skin disease?—The first one suffered from cutaneous disease, but the other evidently suffered from something worse.

16,094. There again no medical man certifies to its having been syphilis; we have simply the opinion of an uneducated man on the point?—When I gave that case in I gave it as the opinion of the parent, and in this instance the parent cannot be regarded as an uneducated man.

16,095. (*Mr. Meadows White.*) There is nothing specific stated about these sores from which a medical man could judge?—Not more than this; the parent was thoroughly of opinion that it was syphilitic contamination; he stated so to me distinctly.



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16,096. (*Mr. Picton.*) In regard to case No. 196, I think I heard you say to Mr. Hutchinson that you had no medical testimony, but in your memorandum you say that 16 doctors attended the case, and nine testified that it was from vaccination?—That was medical testimony; but what Mr. Hutchinson means, I believe is that it was not medical testimony as to the child suffering from syphilis. In respect to the question of syphilis I should like to be allowed to read two short extracts.

16,097. (*Chairman.*) From what?—One is from Fournier's "Lessons on Vaccino-Syphilis."

16,098. We have had that work before us, and have had it referred to several times. We were on these statistics and it would be desirable to get forward instead of going back, unless it is anything arising out of the question before us?—It does not arise out of this particular case, but it is important as a medical opinion bearing on this subject.

16,099. We have Fournier's book, and not one passage of it, but the whole book will be considered by the Commission before the inquiry closes. Will you refer us to the book and give us the page?—It is in a footnote on page 53, of Fournier's work on vaccino-syphilis.

16,100. Do you wish to refer to any other authority?—Yes, the Transactions of the Medical and Chirurgical Society for 1871, page 345, where an opinion is expressed by a distinguished member of the medical profession, Sir W. Savory, similar to Fournier's opinion as to the existence of many cases of vaccino-syphilis, which are not made public. What I wanted to show was that many of these cases might exist, but from the very character of the disease it is extremely difficult to bring them up before the public.

(*Chairman.*) I think you might give the Commission credit for sufficient intelligence to conceive that. We shall be most happy to receive your assistance in bringing anything specific before us, but there must be some limit to these references else we shall never get to the end of our inquiry at all.

16,101. (*Mr. Hutchinson.*) You have no other information to give the Commission of undoubted syphilis which had occurred from vaccination, and you cannot offer us any facts. I do not mean to say opinion, but facts as to the occurrence of these cases?—Not in my own experience.

16,102. (*Mr. Bright.*) Is it impossible to get the evidence of any doctor who attended any of those cases where the parents alleged that it was syphilis which caused the death; are not the doctors living?—Some of them, perhaps.

16,103. Would it not be possible to get the evidence from them that it was syphilis which caused the death, independently of where the syphilis came from?—It might be possible, and I will look into that.

16,104. There is one case by the bye I should like to refer to in which it was said that the child had been vaccinated from another child whose parents were syphilitic. Is there any evidence that they were, or is that your own statement?—That is the statement of the parents of the child.

16,105. It is case 177, "from a child whose father was found to have a bad disorder"?—That is the information of the parents.

16,106. But you have no medical evidence to that effect at all?—I have no medical evidence to that effect, but possibly the parents might have had.

16,107. That was in 1879, and it might possibly be got?—It might, and I will bear it in mind. Before resuming my statistical evidence I may mention that I have found an old report on vaccination to which I should like to refer for a moment. This is a report of the Medical Officer of the Local Government Board, in reference to the small-pox epidemic of 1872. At page 25 I find that the number of vaccinations given here are transposed by a printer's error to the wrong town, but if your Lordship would look at this you will see that for 1872 the number accounts for the principal part of those vaccinations for Leicester which I have given in my table. I notice, too, that the births referred to in this book differ slightly from both the numbers that are found in the return of the Registrar-General. The last town upon the page is Leicester, and when you come to the column showing vaccinations the figures for Leicester are transposed to Hinckley,

the preceding town, and *vice versa*; this is a misprint. But if you take the right number of vaccinations it accounts for nearly all that I have shown in my diagram.

16,108. (*Chairman.*) What year is that?—This is a report of the Medical Officer of the Local Government Board upon vaccination and small-pox for 1872. In this report he gives 3,422 successful vaccinations in that year for Leicester, while our local registrar gives 3,572.

16,109. What is the next point with regard to the statistics to which you wish to direct the attention of the Commission?—At the close of the sitting of the 29th April I was just referring to some extracts from the annual reports of the Medical Officers of Health, and I propose reading one or two more extracts. The first Medical Officer, Dr. Buck, in his report for 1851 writes at great length upon small-pox, and he refers at page 5 to the Bills of Mortality for London in the last century; he says it appears by them "that 10 per cent. of the whole deaths occurred from this disease (small-pox), and there is every reason to think that Leicester enjoyed no particular exemption from this pestilence. Yet when the Legislature declared that the blessings of this sanitary enactment should be made operative in every Union in the Kingdom, we find that in 1842, considerably more than two years after the passing of the Act, the Board of Guardians, after frequent deliberations, came to the conclusion that it was "inexpedient to carry out the provisions of the Vaccination Acts in Leicester." And he goes on to observe, "And as a not unnatural consequence of thus dealing with the Vaccination Acts, we find that in the year 1846"—which I think is a misprint and should be 1845—"small-pox appeared as an epidemic in the town, and in six months proved fatal to no less than 41 individuals." I refer to this because in the Diagram B., which I put in on the last occasion, we carry our optional vaccination period on to 1842 inclusive; and I carry it on to that point on account of the fact that the Board of Guardians passed a resolution not to carry out the provisions of the Act of 1840. The report for 1852 is missing; and before the report for 1853 was written a new Medical Officer was appointed, Dr. John Moore. At page 14 of his report for 1853 he writes: "That scourge to the human race, Small-pox, which in 1852 carried off 52 persons, has during the last year proved fatal in 11 cases only, all of which occurred in the early part of the year; and it is to be hoped that the recent Acts of the Legislature on the subject of vaccination will have an important effect in the prevention, mitigation, or extirpation of this disease." In his report for 1854, page 4, he says: "There were 52 deaths from this disease in 1852, and in the early part of the following year 11. I am happy, however, to state that since that period no fatal case has occurred. I attribute this immunity from the disease to the prompt way in which both the inhabitants and the district medical officers have carried out recent legislative measures with respect to vaccination." In 1855 Dr. Moore, at page 7 of his report, says: "Another year has passed without the occurrence of a single case." And in his report for 1856, at page 6, he says: "For more than three years no instance of this disease has occurred to my knowledge within this borough, but in August last it again made its appearance. The first case was that of a child who had recently arrived from a neighbouring town, where it was known to prevail to a considerable extent, and the child had not been vaccinated. This proved fatal. About 14 or 15 other cases soon afterwards occurred in the adjoining streets, but all of these had been vaccinated; and although in several of them the disease assumed a serious character they all eventually recovered." This is a case of the importation of the disease in 1856. Dr. Moore goes on to observe further: "The effectual manner in which vaccination is carried on in Leicester appears to have had a most salutary effect in preventing the extension of this direful disease." That is in 1856, so that in the opinion of the Medical Officer at that time vaccination had been carried out so efficiently that he believed it had had the effect of preventing an epidemic of small-pox. In his report for 1857, at page 6, he says: "This baneful disease, from which we had been almost exempt for the last four or five years, has, during the last half year, become very prevalent. It has existed in almost every part of the town and although there



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"are no means of ascertaining the real number of cases they must have been very great. It is, however, a source of some consolation to know that up to December 31st, 1857, there had only been 17 deaths, and after a diligent inquiry made into these cases I find that, in only one instance, had the individual been vaccinated." I refer to this report of 1857 to show that while in 1856 the Medical Officer was congratulating himself and the town that our exemption from the epidemic of small-pox was due to the manner in which vaccination had been carried out, in 1857 the disease again appeared and 17 deaths occurred. In the report for 1858, at page 8, Dr. Moore says: "In the year 1856 there was only one death from this disease, in 1857 there were 17, but last year they increased to 53, out of this number 33 had not been vaccinated."

16,110. (*Mr. Meadows White.*) Does he give the number of cases?—He does not give the number of cases; I have read the full extracts from his reports. In the report for 1859, at page 5, he says: "There have only been three deaths from this disease during the year, and they all occurred in the first quarter, two of them at the County Lunatic Asylum, and the other at the Leicester Infirmary; in 1857 there were 17, and in 1858, 53 deaths." In all probability those three deaths which occurred in 1859 should be deducted from the Leicester mortality returns, because they would probably be those of people who did not belong to the borough; however, they are entered as though they were deaths of inhabitants of the borough. In the report for 1860 Dr. Moore observes at page 5: "There have only been two deaths from this disease during the year; one was a child 15 weeks old who had, and the other one of seven weeks who had not been vaccinated. Other cases of small-pox have occurred; but, excepting the two above mentioned, they have generally been of a mild type. In 1859 there were three deaths, and in 1858 as many as 53." In the report for 1861 no mention whatever is made of small-pox, although one death occurred from the disease. In 1862 Dr. Moore says, at page 4 of his report, under the heading of small-pox, "Our borough has been highly favoured by the absence of any great mortality from this disease for many years. During 1862 not a single death was recorded, and in the three previous years altogether only six; this disease has at several periods made its appearance in Leicester, but has not committed such frightful ravages as it has done in some other towns; this may fairly be attributable to the well working of our vaccination system, and, in confirmation, it has been found that whenever the disease has appeared in any locality a house-to-house inquiry has proved that there were but very few cases of children who had not undergone vaccination." That was in 1862. In that year the Medical Officer congratulates the town on the absence of small-pox, and he attributes its absence to the well working of our vaccination system. Now it seems very strange that within two years, even in the succeeding year, an epidemic of small-pox commences which, in 1864, becomes very severe. In his report for 1863, at page 6, he refers to five deaths from small-pox which had taken place during the year; he says that "not one of the parties had been vaccinated. In the same houses were others who had undergone vaccination, and who were also attacked by the disease, but had it in a mild form, and all of whom recovered." At page 4 of his report for the year 1864 he states: "During the whole of the year we have had a severe visitation from small-pox causing 104 deaths, a number far exceeding that of any former year; the first intimation we had of this disease was about the middle of November 1863, when a man suffering under it came from a distance to one of our common lodging houses, and died there. From that time up to the end of the year three other cases proved fatal in the same neighbourhood, and from thence it extended over the whole town. Out of 104 deaths, 37 cases are reported as having been vaccinated, 29 as not vaccinated, and of the remainder no correct information could be obtained." He then goes on to refer to the statistics for previous years, which I need not repeat.

16,111. (*Chairman.*) What is the precise point you are making?—I want to show that each of our Medical Officers of Health, when small-pox has been absent from the town, has congratulated the town upon the fact, and has invariably attributed it to the successful manner in which vaccination has been carried out; and almost in every instance immediately after, and in fact

in this case within the following year, an epidemic took place. The same thing occurs with Dr. Moore's successor, Dr. Crane; he congratulates the town in 1869 and 1870 upon the absence of small-pox, and he also attributes it to the well working of the vaccination system. In fact, the words he used are that "vaccination has been sedulously attended to."

16,112. But supposing they were wrong in attributing too much to vaccination, it would not prove anything, would it, upon the question whether vaccination is of use or not? If you have a considerable unvaccinated population there is no reason why the unvaccinated population should not suffer from small-pox just as they did when nobody was vaccinated?—There is no reason, only one would suppose that even they would be less liable to infection from small-pox in a well-vaccinated community, and I am showing that in the opinion of the Medical Officer of Health the town was well protected by vaccination.

16,113. But when you say "protected," of course "protection" is an indefinite term. We know from your statistics, if the statistics are accurate, that there was a very considerable number of persons who were not protected. Supposing vaccination to be a protection and you have a population with one part protected and the other part not protected, why should you not have some small-pox, even assuming vaccination to be a protection? I do not follow your point?—I do not say that we should not have small-pox, but surely it ought to be confined to the unvaccinated population, whereas Dr. Moore confesses that at least 37 of the fatal cases in 1864 had been vaccinated. But I ought to say that in the opinion of the Medical Officer the reason why we had no small-pox is that we were a thoroughly vaccinated community.

16,114. Your point is to show that they were in error in attributing the immunity to vaccination?—That is so.

16,115. (*Mr. Picton.*) Is not your point to show that in the opinion of the Medical Officers there was practically no unprotected population?—In his opinion, repeatedly given in his reports, that was so.

16,116. The population were uncommonly well protected?—Yes, as far as vaccination protects at all we were undoubtedly a well-protected community.

16,117. (*Chairman.*) If your statistics are right, and if that was what your medical officer meant, he was grossly inaccurate, was he not?—I do not think so.

16,118. But taking your own statistics, your vaccinations do not come up to two-thirds of the births, do they—sometimes not to much more than half?—I think there are not many for those years that are unaccounted for; there are a great many who died before vaccination age, and this number would require deducting from the number of the births.

16,119. But how many people would there be belonging to the early times when vaccination was not used to anything like the extent that it was afterwards? Take the year 1845, supposing that in previous years there had been something like the same amount of vaccination that you show in 1844 and 1845, a great many of those people were alive still in 1860. You cannot take the unprotected population as merely being the population born within a few years before any given date; the population then either protected or unprotected are people who have been born some 30 or 40 or 50 years before?—But is not an attempt now made to show that the deaths from small-pox at that time were principally the deaths of children, and that, therefore, the adult population did not suffer very much from the disease?

16,120. It is suggested that the proportion of children to adults vaccinated was much larger then than the proportion of children to adults now; but I do not think it is suggested that adults did not die then in considerable numbers?—They were not known perhaps in their respective proportions so accurately as they are now known.

16,121. (*Sir James Paget.*) Do you not show, according to your own return, that a considerably larger proportion died of the unvaccinated than of those that were vaccinated?

(*Chairman.*) That is what the Medical Officer says, and we are dealing with what he says; he may have been inaccurate in both cases, but you can hardly take him as having been absolutely accurate in one state-



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ment of facts and absolutely inaccurate in some other point which does not suit your theory.

(*Witness.*) I am reading the whole of the observations in his reports on these points. In his report for 1864 he says, "Out of 104 deaths 37 cases are reported as having been vaccinated, 29 as not vaccinated, and of the remainder no correct information could be obtained," thus showing a probable majority of vaccinated small-pox cases. In an earlier year, in 1858, he says, "Last year they increased to 53; out of this number 33 had not been vaccinated."

16,122. (*Sir James Paget.*) If those 33 were taken from the very small proportion of the population who were not vaccinated, it certainly shows a very much larger mortality amongst the unvaccinated than amongst the vaccinated?—That depends wholly upon what you take as the number vaccinated in the community, and what you take as unvaccinated.

16,123. But you have said that Leicester was always spoken of as a very well vaccinated town at the time; therefore, the proportion of unvaccinated must have been much less than of the vaccinated, yet the proportion dying is much greater amongst the unvaccinated?—This question raises several considerations, two or three of which I may briefly mention: (1) the respective proportions were not accurately known; (2) as far as they are given the proportions vary considerably; (3) we must not forget that the unvaccinated always includes the delicate and those unfit for the operation; and (4) that the whole of the evidence under this head is entirely of a one-sided character.

16,124. (*Chairman.*) In one case you give 16 out of 17 as being unvaccinated?—But still it seems rather remarkable that the Medical Officer should time after time attribute the absence of small-pox to the good vaccination of the town.

16,125. (*Sir James Paget.*) Still we have the facts of the proportion of vaccinated to unvaccinated?—And they had the facts before them also.

16,126. (*Chairman.*) They would not have the facts worked out before them of the relation of vaccination to births; they would only have a general knowledge probably that there were a very large proportion vaccinated?—The point where I think the Medical Officers were wrong was in attributing to vaccination the absence of small-pox for the particular year alluded to. I think they must have subsequently read their reports with some degree of regret, if not compunction, for having made such statements.

16,127. (*Dr. Collins.*) Is there any reason to believe that there was a larger unvaccinated population during any part of the period you have been dealing with in Leicester than in the last few years?—Not at all; on the contrary, it was not nearly so large.

16,128. I find in the report for 1888 there were 21 cases of small-pox given, of whom 16 were vaccinated?—There were 21 cases altogether in 1888, but no deaths, our Leicester method proving effectual in every case. Reverting again to the earlier reports, in the last report of Dr. Moore in 1866, he speaks of the great reduction of mortality in 1866 in the zymotic class of diseases. He says, "only three deaths have occurred from small-pox, nine from scarlet-fever, and 13 from measles." Then we get a new Medical Officer appointed, Dr. Crane, and in his first report for 1867, he says, at page 8, "There were only two deaths from small-pox in 1867, but in 1864 the deaths amounted to 104. We should therefore attend sedulously to vaccination, and not relax our vigilance in preparing for an outbreak of this disease." This appears to me to be very strange language. Why we should be advised to prepare for an outbreak of small-pox when the town is assumed to be protected is beyond my comprehension.

16,129. (*Professor Michael Foster.*) Does not that mean that he does not believe it to be protected?—The previous Medical Officers certainly believed that it was protected, and you will find that Dr. Crane believed so too. He goes on to say, "And as it is prevalent in many parts of the country at this time (particularly at Woolwich, where it is estimated that 400 cases have occurred in four months) it would, I think, be a prudent precaution to take measures beforehand for isolating any important case, should such unfortunately occur, by the provision and preparation of some suitable place to which the case might immediately be transferred. It is only by such means that the future extension of the disease can be prevented or checked."

That statement would appear to convey that Dr. Crane believed far more in isolation than he did in vaccination. In 1868 in respect to small-pox, at page 6 of his report, he says, "I may state as a gratifying fact that during the past year we have had only a single death from small-pox (a child of two months old); a few cases occurred in the town, but in those of which I heard every precaution was taken by the medical men in attendance by vaccination of the unvaccinated, isolation as much as practicable, and proper ventilation and disinfectants to prevent the spread of the disease, and their efforts were crowned with success. The deaths from small-pox during the five past years have been, 1864, 104; 1865, 10; 1866, 3; 1867, 2; 1868, 1; I think we may justly point to these facts as a proof of what vaccination has effected, in the most complete extinction of this formidable disease; but although we may congratulate ourselves on the results which have been obtained, what we have gained is only to be maintained by a steady perseverance in the vaccination of the young children continually added to the population, for as many escape from absurd prejudices on the part of parents, and as the new compulsory Act has not yet been generally put in force, a nucleus of unprotected children is constantly increasing, which may at some future time prove the fuel of a new epidemic." He then goes on to speak about quarantine; and then in his report for 1869, which I think I quoted on the last occasion, at page 9 he said, "I would ask those who decry vaccination, to what other possible cause than it they can attribute the cessation of the disease among us? Of the reality of the blessing there cannot be a doubt."

16,130. (*Mr. Meadows White.*) Does he give any account of the efforts made to isolate or to notify; he recommended in his former report that that should be done; does he give any account of what had been done?—No, I do not think he does; he speaks here only of measures which had been taken; but he has a very long report about it in 1870.

16,131. I mean other methods than vaccination; he speaks of those as having been pursued?—Yes, he makes a passing reference to them, and that is all. In the report for 1870 he alludes to a transport ship called the "Wellington" which sailed for the Crimea in 1854; he refers to small-pox breaking out on the ship and the ship being disinfected, and on her returning small-pox again breaking out, and her being again disinfected.

16,132. But did he say what he advised in Leicester?—He advised the erection of a Small-pox Hospital, which advice was shortly afterwards carried out; then at page 13 he says, "Returning to ourselves in Leicester, I have again the satisfaction of stating that not a single death from small-pox has been recorded during the last year; but you are aware that it prevails most extensively in London, Liverpool, and other large towns. We can scarcely hope, therefore, that our immunity from its presence will be of very long duration." That is immediately after making the statement that our immunity was due to vaccination. Then in 1871 we have again a long report, and in this report, at page 5, he says, "That vaccination, in a great majority of cases, is absolutely protective against an attack of small-pox, and that where it does occur after vaccination the disease is so modified as to disarm it of its terrors, and that the true vaccine lymph is incapable of producing any other disease." He goes on to refer to imperfect vaccination, and he makes this observation: "Another (cause) is from the inefficient performance of the operation, and this cause of failure, I am happy to say, is yearly becoming less frequent." Before ending his long article on small-pox, in the report for 1871, he again attempts to show that the absence of small-pox was due to vaccination. We then come to his report for 1872, which records the great epidemic, and he makes, singularly enough, no reference whatever in this report to vaccination. This fact is very suggestive. At page 7 he says, "The total number of deaths from small-pox is made up from the registered deaths, 314 (which include those that occurred in the old hospital in Friar's Road), and from those also that occurred in the new hospital up to December 31st (32), which were not registered in the mortality returns of the borough, the total number amounting to 346. Mr. Dalrymple has kindly furnished me also with the number of cases admitted into both hospitals. I am, therefore, in a position to estimate the ratio of mortality to cases



"in them up to December 31st; and I calculate that it has been a fraction less than one death in eight cases. On the hypothesis then that the mortality in the houses of the town has been the same (but in reality I believe that it has been greater) the number of cases in the town have amounted to 2,512, and adding to these the cases in the hospital in Freake's ground the total number of cases of inhabitants of the town who had small-pox up to December 31st will have been 3,297, or in the ratio of 3·441 per 1,000 of the whole population." Then he makes a very singular observation, "Taking former experience as our guide, we may indulge, I think, a well-grounded hope that five or six years will at least elapse before another epidemic of small-pox occurs in Leicester." Precisely the same observation might have been made before vaccination had been introduced at all; because it appears from the records, so far as we can gather them, that it had usually recurred at about these intervals; and why, when the town was in a highly vaccinated state, we should still have to hope that only a few years must pass before another epidemic appears, seems to me rather a marvellous comment on his expressed belief in vaccination.

16,133. (*Mr. Meadows White.*) Does he give any statistics as to the vaccinated and unvaccinated?—Not any at all; we are unable to get at them accurately. In his report for 1873, at page 5 he says, "There have been only two deaths from this disease during the year; one of these happened in January, and the other in February; since which I have not heard of the occurrence of any case." His complete silence respecting vaccination, after the experience of 1872, is again very suggestive. I should like now to leave the remainder of the extracts from these reports until we come to the introduction of the system of quarantine dealing with the importations of the disease, because they bear upon that particular part of the subject. In regard to the subject Mr. Meadows White has just mentioned, the only information that we can gather is from the printed newspaper returns. A great number of complaints were made as to the sanitary condition of the town, and finally the Local Board desired the Medical Officer of Health to obtain, if possible, a return of the number of cases, and of the number who were vaccinated and unvaccinated. But I notice that, in one of the Medical Officer's letters, he complains that many of the medical men of the town refuse to send in any returns at all; but on June 22nd, in the "Leicester Advertiser," he published what, I think, were the first returns he had received from the medical men. He says, "For the week ending Thursday, 20th June 1872. Fresh cases since Thursday evening, June 13th 96. Present number of cases now under treatment, 236. Deaths since Thursday evening, 13th June, 10. Of these, 52 were vaccinated and 5 not vaccinated."

16,134. That is 57 cases; what does that relate to?—It relates to the information he had received since the 13th of June, and I think he must be referring to the number of vaccinated cases as compared with the unvaccinated. This is exactly how it is printed in the newspaper: "The above figures consist of the returns from 14 of the 29 registered medical practitioners of the town. Of the remaining 15, seven have made no returns, and eight have no cases. The returns from the two small-pox hospitals are not included, as they have not reached me up to 2 o'clock on Friday, the 21st June.—J. W. CRANE, M.D., Officer of Health." Then, on June 29th, he gives another return: "For the week ending Thursday, 27th June 1872, from all the medical men having cases, and from the hospital. Fresh cases since Thursday evening, 20th June, 98. Hospital, 4; total 102. Last week, 166; diminution, 54.\* Present number of cases now under treatment, 210. Hospital 75; total, 285. Last week, 365; diminution, 83.\* Deaths since Thursday evening, 20th June, 4. Hospital, 1 (not vaccinated); total, 5. Last week, 15; diminution, 10." In another return given on the 6th July: "For the week ending 4th July 1872, in the practice of 21 medical practitioners having cases—"

16,135. (*Chairman.*) The only mention of vaccination is that he mentions that one person dying in the hospital was not vaccinated?—That was all, only one unvaccinated.

\* These figures are copied from the newspapers, but are evidently inaccurate. In Question 16,134, the 54 should be 64, and the 83 should be 80, while in Question 16,138 the 31 should be 21.—J. T. B.

16,136. (*Dr. Collins.*) Does he mention the age in that case?—No I am reading this to show the disjointed and fragmentary nature of the information which exists upon the subject. As I stated before, the record book for the hospital is missing for 1872, but I have ascertained the ages of those who died at the hospital from the register of the Blaby Union.

16,137. (*Chairman.*) I do not think we can get much help from simply having the numbers showing the state of the epidemic at the different dates?—I am only showing that we could not get any reliable facts in a sufficiently complete and connected form.

16,138. We will take that fact unless anybody impeaches it, and then we can go into it?—There is this important return for July the 6th which I had just begun to read. It proceeds: "Fresh cases since Thursday evening, 27th June, 71; hospital, 10; total 81. Diminution since June 27th, 31.\* Present number of cases now under treatment, 171; hospital, 75; total 246. Diminution since June 27th, 39. Deaths since Thursday evening, 27th June, 2; hospital, 2; total, 4. Diminution since 27th June, 1. In hospital, vaccinated, 10; doubtful, 1; not vaccinated, 1. Return of private cases imperfect."

16,139. (*Dr. Collins.*) Were those deaths or cases?—Those were cases.

16,140. (*Professor Michael Foster.*) What is the importance of that?—To show the respective number of the vaccinated to the unvaccinated.

16,141. It depends upon the proportion of the respective populations?—Yes, the proportion might come in; and as you will see from the statements made here by the Medical Officer, to which I think we should attach importance, the number vaccinated exceeds the unvaccinated by an overwhelming proportion.

16,142. (*Mr. Picton.*) Your object would be to show that the number of cases, so far as regards the vaccinated having small-pox, would be in the same relation as the vaccinated to the unvaccinated, in that proportion?—Yes, and even in a larger proportion.

16,143. (*Chairman.*) But you would hardly draw that inference, would you, from a single hospital in one week, in which there are 10 people; you would not think it safe to base any inference upon such a thing as that?—I do not say I should base any such inference upon it alone; but if the figures were the other way we should, no doubt, have a great number of inferences drawn from it.

16,144. (*Mr. Meadows White.*) Have you any other figures?—Yes, for the next week. After giving the usual returns the report concludes: "In hospital not vaccinated, 2; vaccinated, 15. Return of private cases imperfect." And the same figures apply to the following week: "In hospital not vaccinated, 2; vaccinated, 15. Return of private cases imperfect."

16,145. (*Mr. Bright.*) You have no means of knowing what was the proportion of the population in Leicester vaccinated and unvaccinated at the time?—Only from a calculation I have made and which I propose to lay before the Commission later on.

16,146. (*Mr. Picton.*) At that period did the Local Government Board get the proportion of vaccinated and unvaccinated?—Yes, every year we get an annual return, a copy of which is forwarded to the Local Government Board.

16,147. (*Mr. Bright.*) There were 98,000 people in Leicester in 1872?—Yes, and something over.

16,148. You have no means of telling what proportion of those had been vaccinated and which had not been vaccinated?—Yes, approximately. We can cast up the number of vaccinations that had taken place for so many years prior to that date, and although there are some who would have died the population would be made up by others coming into the town who would be equally well vaccinated, and who would therefore supply the places of those who died. I have made a calculation of that kind.

16,149. (*Chairman.*) Apparently one would suppose that it was not well vaccinated from the small materials with which we have to judge, because from 1844 to 1872 is only 28 years, and of the 53,000 population in 1844 a good many would be alive in 1872?—Yes, there would be a considerable number no doubt.

16,150. However, you have made that calculation?—Yes, and I will give the calculation later on.

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16,151. (*Dr. Collins.*) Do I understand that the then Medical Officer in summarising the cases in his following annual report did not utilise such material as might have come to his hand as giving any information regarding vaccination and non-vaccination?—He does not even allude to it in drawing up his reports for the years 1872 and 1873. I have here a large number of extracts (and I should like to ask your Lordship whether I might quote one or two of them) which are taken from the journals of the year 1872, from the "Leicester Advertiser," the "Leicester Journal," and the "Midland Free Press," all referring to the state of the town. They are exceedingly contradictory in regard to its sanitary condition, some of them stating that from a sanitary point of view it is in a good condition, and others just the opposite. There is a letter here from Dr. Marriott which I might read, and also one from Mr. (now Sir John) Simon. Dr. Marriott, in a letter addressed to the "Midland Free Press," April 6th, 1872, says, "I believe (thanks to Mr. Chamberlain, the clerk of the Union) vaccination has been carried out much more efficiently in Leicester than in many other large towns, and at present the epidemic of small-pox is correspondingly mild. I did not say that vaccination was a preventive against a person taking small-pox, though there is strong evidence for such an assertion"; so that in the opinion of an eminent medical man the town was well vaccinated at that time. Then a letter was sent to Mr. Simon in regard to animal vaccination, and his reply addressed to Dr. Nuttall, of Leicester, states: "Local Government Board (Medical Department), Whitehall, S.W., May 3rd, 1872.—SIR,—I am directed by the Local Government Board to acknowledge the receipt of your letter of the 20th ultimo, and to state that the National Vaccine Establishment does not furnish lymph obtained direct from the cow. As regards the general question of the so-called 'animal vaccination' I am to refer you to my twelfth annual report, and to state that the Local Government Board have not thought it advisable to recommend that such vaccination should be practised.—I am, Sir, your obedient servant, JOHN SIMON." Then there is one short extract which I might perhaps be allowed to read as a sample of the others, taken from the "Midland Free Press," April 27th, 1872: "The epidemic of small-pox still continues to flourish in our midst, and death by this hideous disease has seized 13 more victims. And still the Board of Health puts no extra effort, nor, so far as the public is aware, makes any sign that it takes cognisance of the fact that a contagious disease is raging. And, truth to tell, we doubt if the members of that Board do know much about the progress the disease is making. An attempt has been made to obtain from the Officer of Health returns as to the spread of the disease, but that official affirms that he is thwarted in his efforts by the medical men of the town, who refuse to give the desired information. The consequence is the Board is hoodwinked, and its hands are tied. It is impossible to search into the causes of the spread of the disease, to remove offensive collections, to distribute disinfectants, to put persons on their guard against contagion, to ascertain particulars as to vaccination, or in other ways reduce the evil. Such a state of things is most discreditable, and ought not to be tolerated a day longer. The present state of things is simply disgraceful to all concerned, and the Board of Health is bound to remedy it." I have a very large number of extracts from articles in a similar strain, and a number of letters were addressed to the newspapers all through this year 1872. The Local Board were urged on, both in 1871 and 1872, to get the new hospital erected so as to receive patients, but the progress of the building was very slow, and a large amount of the epidemic which occurred in 1872 is attributed to the fact of there being insufficient hospital accommodation to receive patients.

16,152. (*Chairman.*) What is the next point you desire to lay before the Commission?—I will now submit for your consideration the years of highest epidemic small-pox fatality; those are shown in Table 8, and illustrated by Diagram C., which I will now put in. (*The table and diagram were handed in. See Appendix III., Table 8, page 434, and Diagram C., facing page 434.*) In Table 8 the years of highest epidemic small-pox fatality are given in a column, parallel with which are other columns giving the average annual vaccinations to 5,000 births and 25 per cent. of the accumulated vaccinations for five years ending with each of the epidemic years named in the table.

16,153. What do the "500," "1,000," "2,000," and "3,000" in Diagram C. refer to?—To the death-rate per million living, assuming the population of Leicester was a million. This diagram shows the highest epidemic years of small-pox mortality (per million living) in each of seven successive epidemics from 1838 to 1872, ending with the most fatal epidemic year (1872) after a quarter of a century of continuous vaccination. It also shows two fatal invasions of this disease subsequent to 1872, when vaccination was falling into discredit, both of which invasions were speedily stamped out by the Leicester method of treatment. Thirdly, it shows that vaccination being practically abandoned and the Leicester method of sanitation, isolation, quarantine, disinfection, &c. being meanwhile perfected, small-pox mortality entirely disappears after 1883, notwithstanding a considerable number of importations of the disease into the town, mostly from well-vaccinated districts.

16,154. You have only taken a single year?—I have taken a single year giving the highest mortality in each epidemic.

16,155. Does that show it accurately? Why is it that you do not take the years 1871 and 1872 together?—I do take them together, and will show them in that form to the Commission immediately after dealing with this diagram.

16,156. (*Dr. Collins.*) There were only 12 deaths in 1871, were there?—Yes, only 12 small-pox deaths in 1871.

16,157. (*Chairman.*) Where it strikes me as important for the purpose of comparison is with 1845. If you take 1871 and 1872 together, and then take 1845 and 1846 together, I think you will find that the mortality per million living was much the same in 1845 and 1846 as it was in 1871 and 1872?—It comes very near to it, but is lower.

(*Chairman.*) In fact if you take three years it seems to have been going on in 1844, 1845, and 1846; in the other case 1871, 1872, and 1873, it had almost died out in 1873, still it is spoken of as the conclusion of the epidemic. If you take those three years together and compare them with the other three years, I think you will find they are very much the same. I think that the period from 1844 to 1846 shows rather more than from 1871 to 1873.

16,158. (*Mr. Meadows White.*) The years 1839, 1840, and 1841 would combine?—I take them in groups of five years immediately afterwards; so that we shall see the full effect of that which his Lordship suggests.

16,159. (*Chairman.*) Now this table takes the highest years of epidemic between 1840 and the present time?—The rate of small-pox mortality is shown by the black column; the annual rate of primary vaccinations is shown by the blue curve.

16,160. (*Professor Michael Foster.*) What is the dotted part?—It is dotted because in Diagram C. it is not continuous; it is dotted over the intervening years.

16,161. The blue part only is the ascertained part, is it?—The other part has been ascertained, but it is not necessary to show it.

16,162. (*Chairman.*) Then why do you not take your dotted line straight up? It looks as if the dotted line continued for a time until there came a sudden change. Is that the case?—No, that is not the case; the dotted line does not signify any rise or fall except so far as the solid red and blue lines indicate a rise or fall.

16,163. Then I see that your blue and red lines do not merely go over the particular year indicated; is that intentional, or is it an accident in making out the diagram? They seem to go over two years generally?—They are intended to go over and refer to one year only. For each of the separate years shown on this diagram the average annual infantile vaccinations are very high, and there is a progressively accumulating vaccinated population up to 1872, which, I think, bears upon the question which was put to me by Mr. Bright. The year of highest accumulated vaccinations was 1872, when its alleged protective power was therefore greater than in any preceding year, and when also our small-pox death-rate was higher than ever it was known to be in the history of the borough.

16,164. But now, may not the higher vaccination rate be the effect rather than the cause of the small-pox epidemic?—It was not so in this case, because the red curve shows the accumulations during the previous five years, so that they would be vaccinations accumulated before the epidemic set in.



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16,165. How do you arrive at that accumulated vaccination for five years?—We cast up the number of vaccinations for the previous five years and then show 25 per cent. of these accumulated vaccinations on the diagram—there is only a quarter of them shown; as we cannot show more without having two sets of scale figures, which would be very inconvenient on the same diagram.

16,166. (*Professor Michael Foster.*) That is, the accumulation of vaccinations not the accumulation of vaccinated persons?—We take the accumulations of five years' vaccinations.

16,167. But accumulation of vaccinations not accumulation of vaccinated people?—I do not see the distinction you mean.

16,168. Surely there is a distinction, because, supposing there is no vaccination until five years before, by the time you have vaccinated everybody this curve would be very high indeed, but still it might show a very ill-vaccinated population?—Five years of vaccination of the births of a previously unvaccinated community would not raise the red curve very high; because as you will see that the vaccination of those in past times from 1849 are not included unless within five years of the epidemic years given on the diagram, so that such an observation could not possibly apply to this diagram.

16,169. But accumulated vaccinations in any five years do not of themselves show very much as to the vaccinated condition of the population?—I should have rather thought they did.

16,170. Not for five years only—accumulated vaccinations merely means the total number of persons born in five years who had been vaccinated; therefore, it only shows you the condition of the population under five years old; that is to say, of the survivors of those who have been born in the last five years, and who, of course, must be under five years old. That is all that it shows of itself?—That is all that it shows for the five years, but then it shows also the time of life at which, if there is any protection at all, it should be in strongest force. If there be any protection in vaccination at all it is greatest in the first five years of life and the five years afterwards; and this is what I am trying to show.

16,171. (*Sir James Paget.*) Have you any return of the ages of those who died of small-pox during the period covered by that table?—Yes, I have that information.

16,172. Are the large majority under five years or above?—I could not tell at the moment, but I will answer the question when I come to that subject further on.

16,173. (*Dr. Collins.*) When the red mark in your table is high it would, at any rate, indicate that the population under five in Leicester was largely protected by vaccination?—Yes, that is so.

16,174. The Commission has been informed that during unvaccinated times and in unvaccinated countries the proportion of small-pox deaths under five to the total small-pox deaths is something like 80 per cent.; probably you are aware of that information?—Yes, I have heard that asserted many times.

16,175. As touching the question of the years 1871 and 1872, and the possible influence of the epidemic in augmenting the amount of the vaccination, am I right in saying that 1871 with only 12 small-pox deaths showed a higher proportion of vaccination to births than 1872, when there were 346 small-pox deaths?—Yes, according to the official mode of reckoning.

16,176. Do you happen to know whether the large proportion of vaccinations referred to the year 1871 took place in the latter half or the last quarter of that year?—That I cannot tell. I have not looked into the quarterly distribution of the operations.

16,177. (*Mr. Bright.*) But leaving the question of vaccinations in 1871 out, is it not the case that there were a very large number of vaccinations in the previous three years?—Yes, there were a very large number in the previous four years, from 1868.

16,178. So that the town must have been, as they say, well vaccinated?—It must have been, though I do not think there were many more vaccinated proportionately in 1871 than there were in 1868 and 1869, as you will see if you look at the top of the blue columns on Diagram A. showing the unvaccinated.

16,179. (*Mr. Meadows White.*) Taking your Diagram A. before 1868, there is a considerable amount of blue uncovered by red?—Yes, but these would be less if the "Extra Vaccinations," referred to in a footnote on the chart, had been shown distributed to their respective years.

16,180. You have not any figures to show what became of those, whether they were afterwards vaccinated or not, or whether they remained unvaccinated?—No, I have not any complete figures, but the figure given would include most of them up to 1864. In all probability a number of those remaining after 1864 would be vaccinated from 1868 to 1872; but they would not be shown on my Diagram A.

16,181. 1867 is a very low year, comparing vaccinations with births?—Yes, that was the last year before the appointment of the Vaccination Officer.

16,182. And that is only four years from 1872?—Yes, only four years, but I include 1872 to make five years for the accumulated vaccinations on Diagram C.

16,183. (*Chairman.*) Referring to the registers for 1871 I find—Born August 15th, 1871; vaccinated April 10th, that is 1872. Born September 3rd; vaccinated in March next year. Born July 30th; vaccinated in January. Born August 26th; vaccinated in March the next year. That is on two pages out of about 15 names. Born in August; vaccinated January the next year. Born on September 1st; vaccinated in January. Born August 3rd; vaccinated January next year. Born July 31st; vaccinated January. A large proportion seem to have been thus postponed.

(*Dr. Collins.*) Those were all born after the 30th June.

(*Chairman.*) Yes, they were. In April there was one born, vaccinated the following January.

16,184. (*Professor Michael Foster.*) Do you know what the small-pox mortality was per month for the year 1872?—The whole small-pox mortality of the year was very high, but I cannot tell you what it was month by month, except from those extracts such as I read from the newspaper. One of the newspapers says that the town was very healthy, and that the number of deaths from all causes was no more than if we had no epidemic.

16,185. When was the epidemic fiercest?—About the middle of 1872; a thanksgiving service was held on November 16th, 1872, because of its declining considerably.

16,186. (*Mr. Picton.*) Was it finally abated then?—No, it continued until the end of 1872; and there were two deaths in 1873. Resuming my statement, I may go on to say that the two small-pox invasions of 1877 and 1882 occur when vaccination is rapidly declining; after 1883 vaccination sinks very low indeed.

16,187. (*Chairman.*) But not in 1877; it was not declining then, was it?—The births vaccinated were.

16,188. But not your five years' accumulation, that had got higher still?—Yes, the accumulation of the figures was necessarily higher still.

16,189. (*Dr. Collins.*) That would include the year 1872?—The vaccinations of 1872 would be included in the line over 1872. After 1883 vaccination sinks very low; from that date we have no small-pox deaths to tabulate. Then I have a reference to make to a matter that was alluded to by your Lordship recently in a question which you put to me. It has sometimes been alleged that the prevalence of small-pox is a direct cause of an increase in vaccination. However this suggestion may be borne out elsewhere, the epidemic of 1872 is a striking example of the exactly opposite result. An enormously high rate of vaccination was inaugurated in 1868 and was maintained up to 1872 in Leicester. In this instance the increased amount of vaccination preceded the epidemic, and immediately, even during the following year, a decline of vaccination set in, which has continued almost unbroken to the present hour. The small-pox epidemics of 1858 and 1864 were also preceded by an increased amount of vaccination, and then followed by a decline in the practice.

16,190. (*Chairman.*) In 1858 there had been no increase, had there?—It was preceded by a high rate of vaccination, and immediately after 1858 you will see it is lower.



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16,191. (*Professor Michael Foster.*) The blue are all primary vaccinations—public and private?—Yes, they are, on Diagram C.

16,192. Confined to primary vaccinations?—Yes, entirely to primary vaccinations. The blue curve shows vaccinations to births.

16,193. (*Chairman.*) But there it differs from your Diagram A. ?—Yes, to some extent, because Diagram B. gives an annual rate of vaccination while Diagram C. gives an average annual rate for five year periods.

16,194. (*Professor Michael Foster.*) The red is based on the blue?—Yes. The blue curve is an average annual rate of vaccinations to 5,000 births, and the red curve shows the accumulated vaccinations for the same five year periods. Before I put in the next diagram and table I should like to refer to some notes that I have made from the death registers. In 1841 there were three deaths of children, aged two and three respectively, entered as dying from small-pox after vaccination; in 1845 there were 13 entered as dying after vaccination, four in the east district and nine in the west district; the ages of those in the east district being respectively 32 years, two years and eight months, 10 years, six years, and two marked "doubtful;" that is to say, it was unknown whether they were vaccinated or not. In the west district there was entered a case aged two years and six months, dying two weeks after vaccination; one aged six years vaccinated in infancy; one aged one year and nine months, dying 14 days after vaccination; one four years and nine months, nine days after vaccination; one aged seven months, eight days after vaccination; one aged five years and three months, 14 days after vaccination; one aged nine months, 10 days after vaccination; and two cases, aged respectively 20 years and 22 years, both vaccinated in infancy.

16,195. (*Chairman.*) Were those deaths from small-pox?—Yes, they were all deaths from small-pox.

16,196. Where do you get the number of days after vaccination?—This is entered in the register of deaths.

16,197. (*Professor Michael Foster.*) That is to say, that is the date of the death after vaccination?—Yes, and it is entered by the registrar. I took these notes

out of the register, because they were the only particulars I could find respecting vaccination being followed by small-pox.

16,198. (*Chairman.*) Was that the return of the medical man certifying the cause of death, or how was the information obtained?—I should think it would be an exact copy of the medical certificate or the registrar would not enter it.

16,199. What heading does it come under—under "Cause of Death"?—Yes, under "Cause of Death." It is an observation apparently made on registering the death, thus:—"Cause of death, small-pox," "within 14 days," or otherwise as the case may be. Then in 1846 there is one death from small-pox, entered as being "after vaccination," of a child aged six years; in 1848 there is one entered as dying from chicken-pox, a week after vaccination; in 1849 there is one entered as dying from mixed pox, that we have included in the small-pox, because we thought it might possibly be small-pox. Then in 1852 there are four deaths from small-pox, all entered "after vaccination," of the ages of two years, five months, eight and 17 years respectively; the one aged 17 years dying from confluent small-pox. There is also one death of a child aged four years entered "one year after cow-pox." In 1864 there were 10 deaths from small-pox marked "vaccinated"—one three years, "vaccinated the day after the poison of small-pox had been received into the system"; one 11 years, "vaccinated, but without effect"; and the ages of the others were nine years, five years, six years, four years, five years, 26 years, one year, and six years respectively. The one dying at six years old died of confluent small-pox. In 1872 there were four only marked "vaccinated" in the west district, aged 43 years, 11 years, seven years, and four months respectively; and there were six marked "unvaccinated" out of 90 odd deaths in this district. The others have no reference at all either to vaccination or no vaccination. In the east district there are eight marked "unvaccinated" and none marked "vaccinated" out of about 220 deaths in that district, so that there were only four marked "vaccinated" out of the total of 314 deaths for that year, which to my mind is a grave reflection on the accuracy of the registration.

Adjourned till Wednesday next at 1 o'clock.

## Sixty-seventh Day.

Wednesday, 3rd June 1891.

PRESENT :

The Right Hon. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORDY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.  
Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary.*

Mr. JOHN THOMAS BIGGS further examined.

3 June 1891. 16,200. (*Chairman.*) I believe it is your wish to defer a part of the evidence on the general heading of "statistics of mortality from small-pox," and deal with another subject?—That is so. I have been unable to deal with the vaccinations as suggested last week; therefore I propose to defer that part of the subject and to deal with another branch which comes under the second head of the reference to the Commission, as to "what means other than vaccination can be used for diminishing the prevalence of small-pox, and how far such means can be relied on in place of vaccination."

16,201. (*Mr. Picton.*) Would you kindly explain the reason why you have not dealt with those figures which you were asked on the last occasion to make clear?—The reasons are these, when I got to Leicester I found that the Vaccination Officer was ill with influenza, and my clerk was absent from the town. Also a part of the vaccination books were in London and part were in Leicester, so that it was utterly impossible for me to do what I was asked to do.

16,202. (*Chairman.*) The change you wish to make is for the purpose, therefore, of an addition to those tables,



rather than of correcting them?—Of course I cannot tell until I have made a further examination what adjustment, if any, there may be required in respect to them.

16,203. Will you proceed with your statement?—The branch of the subject with which I now propose to deal is in regard to the importation of small-pox and the number of cases which have occurred since 1873, also in regard to the method of dealing with small-pox in Leicester, and having reference, more particularly, to the measures taken for quarantine. For many years past, especially since the subsidence of the small-pox epidemic of 1871-73, and since the decline of vaccination became more pronounced in Leicester, the town has frequently been the subject of adverse criticism by medical men; by the medical press in particular, and also by the press of the country at large. It only needed one of the leading journals, either the "Times," the "Lancet," or the "British Medical Journal," to publish some startling paragraph, for it to be slavishly and promptly reproduced by less pretentious journals all over the country. Down to the present moment these oft-repeated prophecies of the decimation of the Leicester population by small-pox have proved to be utterly fallacious. The earlier prophecies were exceedingly impatient, threatening immediate disaster, but in later years prudence has somewhat modified the wild and erratic predictions of the past.

16,204. Could you give the Commission the facts relating to the point under consideration, rather than comments of this description?—I am leading up to that. The practical test of experience is tending down the extravagance of these futile conjectures, and, judging from the language now used, Leicester is evidently safer from small-pox than it was supposed to be a few years ago, and this no doubt is so.

16,205. (*Sir Charles Dalrymple.*) Who says "no doubt that is so"?—That is an observation of my own, based upon the facts of the case. The time fixed by these would-be sages was always future; but instead of the decimation of Leicester being placed only a year or two in advance, as at first, it is now generally fixed at several years to come. For the purpose of more clearly showing the large number of importations of small-pox into Leicester since 1873, I have prepared Diagram D. with an explanatory table given upon the diagram, and I will now put it in. (*The diagram was handed in. See Appendix III., Diagram D., facing page 435.*) This diagram shows the total number of small-pox cases which have occurred in and near Leicester since the subsidence of the great epidemic of 1871-73. Most of these cases were due to importations from efficiently vaccinated towns and districts. Of the total number of 116 cases, 69 occurred during the years 1877-83. Out of these 69 cases 18 deaths resulted, giving a fatality of 26.1 per cent. Of the 47 cases which occurred during 1884-89 no deaths resulted, thus giving a mean fatality of 15.5 for the whole 116 cases. From 1874 to 1889 inclusive, during a period of 16 years, no less than 30 importations and a large number of successive outbreaks of small-pox were successfully stamped out, and the town saved from the further spread of the disease, with its possible ravages, by the Leicester method of treatment, without recourse to vaccination. The table gives the number of importations, the number of small-pox cases, the number of deaths resulting and the fatality per cent., and in the last column upon the diagram, the places are given from which these importations took place so far as it was possible to ascertain them.

16,206. (*Chairman.*) Does this mean that all the cases which took place in Leicester during those years were imported cases?—I believe that all the outbreaks of the disease were due to importations.

16,207. So I understand; but I mean where you put down so many cases in a year, does that mean that they were all imported cases or that some of them were the results in the town of the importation of the disease amongst the inhabitants of the town?—They were not all directly imported cases, but those which were not were due to infection from the imported cases. There is one reference I would make to the year 1875, which is to be found in the footnote to the table. "A child of tramps passing through the town died of small-pox in 1875, but this case is not included in the deaths by the Medical Officer of Health." That is the only case, so far as I know, during the whole series of years where any case of small-pox has not been included, whether

being the case of an inhabitant of the borough, or the case of a tramp, or a person outside the town altogether, but I have included it.

16,208. Take the year 1881, with four importations of small-pox and six cases, I suppose four cases out of the six were the four importations?—Yes, they were.

16,209. And there were two others?—There were two others arising from those four importations.

16,210. Were there any of those cases where a family came, so that, although you had only one importation, you had several cases amongst the people with whom the importation arrived?—I propose to read extracts from the Medical Officer's reports, which will show all the details better than I can give them from memory. I should just wish for a moment to direct the attention of the Commission to Diagram D. Each square represents one case, and the darker coloured squares represents the deaths. In the period from 1874 to 1883, when vaccination was rapidly declining, and the Leicester method of treatment was being introduced, there were 18 importations, 69 cases of small-pox, and 18 deaths. Then from the years 1884 to 1889, when vaccination was practically abandoned, there were 15 importations, 47 cases of small-pox, but no small-pox deaths. I should like to call attention also to the footnote at the bottom of the diagram. It is as follows:—

"The only vaccinations or re-vaccinations of quarantined persons recorded in the annual reports of the Medical Officers of Health are two in 1886, and six in 1888. Some are referred to in 1887, but exact information prior to 1886 is not obtainable, owing to no register having been kept at the Fever Hospital. The total number of persons placed in quarantine for 1885-1888, was 65; namely, 10 in 1885, 2 in 1886, 14 in 1887, and 39 in 1888, since which date no small-pox cases have either occurred or been imported into the town."

16,211. (*Professor Michael Foster.*) With regard to the mortality shown in your Diagram D., how is that shared as between the imported small-pox and the small-pox which was the result of that importation, amongst the inhabitants of Leicester?—I think we shall be able to arrive at that from the further extracts I am about to read from the Medical Officer's reports. We left off last week with an extract for 1873, and this which I am now about to read is taken from the report of 1874 by the same Medical Officer, Dr. Crane. He says at page 8: "It is a subject of congratulation that this year there has not been a death from small-pox, and I believe not a single case; last year there were only two." In the report for 1875 reference is made to the case, which I have already alluded to, and which is not included by the Medical Officer in the deaths for the year 1875, but it is included in my figures shown on Diagram D. Speaking of the comparative mortality from the principal diseases in each class, the Medical Officer says, at page 5: "I shall commence with the zymotic diseases, at the head of the list of which is small-pox, and I am happy to say that in 1875 no death took place among the inhabitants of the borough. A case, however, occurred in a common lodging-house. It was the child of a tramp who had come from Birmingham with its father and mother. Sergeant Buxton heard of the case. The whole family were immediately conveyed to the hospital in Freake's Ground, where the child died; the father and mother escaping the disease left the town. The lodging-house was temporarily closed and thoroughly disinfected, and no case has since occurred in the town. Such examples as these show how indispensable it is to have such a hospital to which patients can be transported without delay." In the report for 1876 no mention whatever is made of small-pox; there is a reference to an epidemic then existing of scarlet fever, but I do not know that it is necessary for me to read that extract. In 1877, or in the latter end of 1876, owing to the advancing age of Dr. Crane, the sanitary committee appointed an assistant Medical Officer, Dr. Johnston, and in the year 1877 Dr. Johnston deals with the subject of small-pox in a special report. In the usual report written by Dr. Crane, at page 3 he says: "You will be gratified to learn that there has again been a reduction of the mortality of the borough of Leicester during the past year, 1877, the deaths returned to me by the registrars having amounted to 2,526, to which we must add five deaths from small-pox and one from erysipelas which occurred in the Borough Hospital in Freake's Ground, also 23 patients who died at the Leicester

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"Borough Asylum at Humberstone, making a return of 2,555; from this total we deduct 40 deaths, which took place at the Leicester Infirmary, of persons who were not formerly inhabitants of Leicester, which will make the corrected mortality 2,515, thus showing a decrease on the previous year of 43." We now come to the first special report by Dr. Johnston, who for several years wrote special reports upon the deaths from zymotic causes in Leicester, and I might also explain that he with Inspector Braley, the chief sanitary inspector, claims to have introduced the special system of dealing with small-pox which is now carried out in Leicester. Referring to small-pox, he says: "Last year this truly loathsome disease again appeared in the town in its most malignant form after an absence of more than four years. Six deaths were registered as having occurred from the malady, only five, however, resulted from it." I show six deaths on Diagram D., because six are recorded as having resulted from the malady, and the above is the explanatory note by the assistant Medical Officer.

16,212. (*Chairman.*) But the six are out of 13 cases. You have made the six out of 12. You will see that 12 is the number out of which five succumb, so that therefore if you add one death, which he does not add because he says it was not small-pox, you must add one to your number of cases and make it 13 instead of 12?—I do not think so, but I am willing to add if it can be shown to be necessary. Although the Medical Officer returns six deaths in the subsequent reports he never mentions more than 12 cases.

16,213. He says: "The disease was hæmorrhagic in character, and affected altogether 12 cases." Then he says: "Out of these five succumbed," so that he cannot be including that one which was not small-pox at all: but you had better read on?—"About two months previous to its first appearance and spread a death took place which was certified as small-pox, but from information subsequently obtained with respect to it I have no hesitation in saying that the case was not one of small-pox. The small mortality experienced from the visitation of the disease was chiefly owing to the unremitting zeal displayed by the sanitary inspectors (Sergeants Buxton and Braley) in rapidly transporting to the Borough Fever Hospital those suffering from the disease when once they gained information respecting them. The disease was hæmorrhagic in character, and affected altogether 12 cases. Out of these five succumbed, showing a mortality of 41·6 per cent."

16,214. Is it not clear from that that if you include that one which he says was not small-pox your number of cases ought to be 13 and not 12?—I am not quite certain as to that; it would almost appear so from the reading of the return, and I am willing to add one; but I should like to say this, that Dr. Johnston was afterwards appointed Medical Officer of Health, and he does not eliminate this one from the tabulated cases, so that he practically accepts the fact that the six died. So that whatever the number of cases may be, there are six deaths recorded. Then the report proceeds: "which is by no means a high death-rate if the fatal character of this variety of the malady be taken into account. After most careful inquiry I was unable to trace the source of the primary infection, but the 11 succeeding cases were found to have received it from the first affected. Now, of the five fatal cases three were vaccinated and two were unvaccinated. Of the three vaccinated cases one was a man in his 59th year, who had been vaccinated when he was three months old, and therefore any protection which the operation afforded had ceased to exist long before his demise. Neither of the other fatal cases had been efficiently vaccinated, exhibiting as they did small and imperfect cicatrices." Dr. Johnston then goes on to describe the plan which he adopted; he says: "As the plan which I adopted in the removal of these cases is novel and may be found useful by Officers of Health in other towns for preventing the spread of the disease I may be pardoned if I again draw attention to it. In any house where a small-pox case occurred I endeavoured to impress the inmates with the fact that the removal of all the members of the family to the hospital was the best course to adopt, not only as regarded their own individual welfare, but also that of the town at large. And I am glad to say that all complied with my request, left their infected habitations and became inmates of the hospital.

"Altogether 22 unaffected cases were thus admitted into quarantine, and of these three after admission sickened. The first case sickened in 48 hours, the second in 72 hours, whilst the third showed no symptoms of the disease until the twelfth day. Now all these cases must have been infected before admission, as small-pox appears on the skin on the fourteenth day after the infection of the disease has been received into the system. The epidemic had got firm footing in the town as it expressed itself in no less than six places, viz., Birstall Street, Chester Street, Gresham Street, Argyle Street, Watling Street, and Newby Street. The suppression of what might otherwise have proved a wide-spread epidemic, attended with great fatality, was entirely due to the early information received of the cases affected and the promptitude observed in their removal. As immediate reporting of the cases is of paramount importance in their limitation it is most desirable that the Corporation of Leicester should endeavour to obtain from Parliament authority to compel the registration of infectious disease within the borough." Dr. Johnston then goes on to refer to some Acts of Parliament relating to other towns which I do not think I need read. He was very assiduous in advocating the obtaining of an Act of Parliament for compulsory notification, and as a matter of fact Leicester did obtain one in 1879.

16,215. (*Mr. Picton.*) Could you tell the Commission what was the effect of that?—It did not differ materially from the general Act which is now in force, excepting in this particular, that the fine for not giving information is 10*l.* in our local Act as against, a fine of 2*l.* provided for in the general Act applied to the country, but I believe proceedings have been taken in one case only, where, speaking from memory, a fine of 1*l.* was imposed.

16,216. As a matter of fact was it universally obeyed?—It was opposed in the first instance by the medical profession, but I think without exception they are now all thoroughly in favour of the Act and willingly fall in with its provisions.

16,217. (*Dr. Collins.*) Upon whom does the responsibility for notification rest? Is it the householder, or the householder and the doctor, or the doctor only?—Upon both, I believe.

16,218. (*Professor Michael Foster.*) Does Dr. Johnston discuss when the 11 others of the 12 took the infection from the first case?—I have read the whole of the statement that he makes with respect to them.

16,219. There was no statement with regard to that in what you read. What is there to distinguish this one case as imported from the other 11 cases?—He says: "After the most careful inquiry I was unable to trace the source of the primary infection."

16,220. Why is one put down as picked out of the 12 small-pox cases, what is the evidence differentiating the other 11 cases from this one?—Because in a subsequent report Dr. Johnston quotes this case as an importation.

16,221. He does that afterwards?—Yes, in a further report which I will read.

16,222. (*Mr. Bright.*) It was the first case which occurred, I suppose?—Yes, the case he subsequently alludes to was the first case which occurred.

16,223. (*Professor Michael Foster.*) But is this a case where one case is imported and 11 take it from that imported case, or have you put down as imported the first case which occurred, whereas the others might equally have been imported, and have occurred at a subsequent period?—The Medical Officer says that the 11 cases received the infection from the first case affected; but that after inquiry he is unable to trace the source of primary infection.

16,224. If he was unable to trace the source of primary infection, how do you know that it was an imported case?—I have put it down in my table as "Unrecorded," but in another report Dr. Johnston subsequently refers to it as an imported case.

16,225. What I understand you to mean is that he could not find where the person got it who was first affected, but that he knew where that person came from?—According to the statement he makes in a subsequent report it was an importation. In 1878 Dr. Johnston again writes another special report, and at page 11 of this report he says: "Only one death, I am happy to say, took place from small-pox during



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"the year. The disease was imported by a family of vagrants from London. These people had taken up their residence in a lodging-house in Abbey Street, and two of them were suffering from small-pox. Notice was given to the sanitary inspectors of the existence of the disease, and the cases were forthwith removed to the hospital. The following day, after considerable difficulty, I prevailed upon all the other lodgers in the house, 19 in all, to allow themselves to be placed in quarantine at the hospital. The lodging-house thus emptied was thoroughly disinfected, and some of the bedding destroyed. A few days afterwards another case was reported to exist in a yard opposite the house where the others had resided. This case was immediately removed, and the parents were quarantined in the hospital, the house also being disinfected like the previous one. The inspectors kept a careful watch over all the houses in the vicinity, but no fresh case appearing, the outbreak was found to have been stamped out. But for the facilities afforded by the hospital for isolation there is no doubt that the disease would have spread rapidly over the town, and given rise to great mortality as it was of a virulent form, the confluent. Three of the quarantined people sickened after admission, one on the second day, one on the fourth day, and one on the eleventh day, showing that each one had received the infection previous to entry into the institution." Then Dr. Johnston gives a table which I need not read. He then says: "The annexed table presents a striking example of the cyclical recurrence observed in the visitations of this disease during the last 27 years." The table embraces the years from 1852 to 1878, and he observes: "It would appear from the above that the regularity of the visitation of the disease was preserved by its appearance in the town during 1877 and 1878. The mortality, however, which marked its previous returns was, in these last instances, confined within very narrow limits."

16,226. What was the date at which the case occurred in a yard opposite the house where the others had resided?—It says "A few days afterwards."

16,227. Do you know what that means?—I really do not know definitely, but I should think five or six days.

16,227a. (Professor Michael Foster.) The Medical Officer discusses whether that might not have had an independent origin. Are we here again in this table to suppose that six out of the eight are derived directly from those two?—It would appear so from the Medical Officer's report.

16,228. (Chairman.) I do not see the eight, he only mentions six as far as I can see; two persons brought in suffering from small-pox, another case reported to exist in a yard opposite the house where those were suffering makes three. Then, "three of the quarantined people sickened after admission," that makes six, what are the other two, do you know?—I think you will find an explanation of that at the beginning of the 1879 report. These reports are very incomplete and defective, and it is sometimes necessary to refer to two or three subsequent reports before you can get at the actual facts. If you turn to page 19 of the report for 1879 you will find the explanation of this matter. He says there, speaking of the Fever Hospital, "During last year 269 patients were admitted into the hospital, namely, 247 cases of scarlet fever and 22 of erysipelas. The admissions in 1878 were in all 78, namely, 51 of scarlet fever, 8 of small-pox, and 19 of erysipelas," that is all the explanation he gives of the eight cases.

16,229. (Professor Michael Foster.) Were there two cases which occurred at some other time of the year?—That I cannot answer positively, but I should suppose so, I can only give the information I get from the Medical Officer's report, which in this instance is very meagre.

16,230. If so, were those two cases imported cases, do you know; do you know whether any of those three who were taken ill after their removal to quarantine belonged to the same family as the original two, or were they inhabitants of Leicester?—You will find an account of the cases at page 16 of the special report of 1878, which explains this matter. At the end of the special report you will find on page 15, "Summary of cases admitted into the Borough Hospital suffering from infectious disease from 2nd January to 31st December 1878;" and then if you turn to the next page 16, No. 34 is reported to have come from Abbey Street, the age of the child being three. Case No. 35 came

from No. 2, Abbey Street, a child aged 10. Case No. 36 is another coming from Abbey Street, aged 13. The admission of the first case was on June the 3rd, and of the other two cases on June the 4th. Then there was a case, No. 37, aged 38, admitted from the Union Workhouse.

16,231. Where is Gavin's Yard? Is that in or near Abbey Street, do you know?—I can scarcely tell you exactly where the locality is, but it is leading off Abbey Street.

16,232. Gavin's Yard is probably the "yard opposite" site?—I should think so, in fact that must be the yard referred to.

16,233. Are cases aged 3, 10, and 13 the cases which developed after the two, or are two of them the two?—I should think the one aged three is probably the first case, because it was admitted on June the 3rd.

16,234. The one aged 13 is of the same family I suppose?—I should like to explain this, that Abbey Street is a street of lodging-houses for tramps and poor people, it is situated in Belgrave Gate. This might be a child of the same family or of another family lodging in the same house.

16,235. Three were admitted into the hospital, and the question is whether any one of them came with the other two, and therefore ought really to be considered as an imported case as well as those two?—That is a question which it is impossible for me to answer, as no information exists on the subject.

16,236. Then, I suppose, we must infer that we must not make a distinction as in the case of the third column of the table you give on your Diagram D. It does not necessarily follow that the persons in the third column are persons who have taken the disease from the persons in the second column?—The Medical Officer says they are, and the distinction has been made on the authority of the Medical Officer's reports.

16,236a. (Chairman.) Not necessarily so, because they may have been members of this family, two of whom were suffering from small-pox when they arrived?—There is no information on this point.

16,237. (Professor Michael Foster.) The one aged 13 developed it a little later?—You will find the Medical Officer refers in his tabulated statement of hospital cases to the number of small-pox cases which he gives as eight. He also refers particularly to this year in a subsequent report.

16,238. (Chairman.) Do you know anything of the Union Workhouse case; all the others seem to be from this Abbey Street centre. Is the Union Workhouse any where near Abbey Street?—No, it is a long way from that, perhaps a mile away. I know that in the opinion of the sanitary inspector the Workhouse case which had been moved from a lodging-house in Abbey Street was the probable source of the primary infection.

16,238a. (Professor Michael Foster.) Perhaps the Workhouse case makes up the eight?—It certainly is included in the eight.

16,238b. (Dr. Collins.) The second column is not headed "Imported cases" but "Importations of small-pox"; probably you had some such object in view when you adopted that heading?—Yes, I had that distinction in my mind.

16,239. (Sir James Paget.) You cannot say, perhaps, whether "Importations" means the number of cases imported or the number of times in which there were importations?—It means the number of persons suffering from small-pox who were known to have come into the town with the infection.

16,240. Therefore in that year there would only have been two, not three?—I have only given two. The language quoted here is taken from the report of the Medical Officer, because, as I have before stated to the Commission, some of the case books of the hospital are missing. Dr. Tomkins tells us of their loss in a letter which I will read later on, and this is probably the most accurate report that we can get from which I am now reading. There is another case, No. 38, from Gavin's Yard, aged three, which was admitted into the hospital on June 5th.

16,241. (Professor Michael Foster.) Gavin's Yard is opposite to Abbey Street, probably?—It is the yard referred to, but it is now known as a court. Then we come to cases Nos. 42 and 43, which were admitted on June 13th, one aged six and the other nine. Then there was another case, No. 44, admitted on June the



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15th, a child aged three. These three are from Abbey Street. That makes the eight cases.

16,242. (*Chairman.*) There were reported altogether from Abbey Street six, from the Workhouse one, and from Gavin's Yard one?—Yes, in all probability the young cases would be the children of tramps, and the one from the Workhouse would also probably be a tramp.

16,243. (*Professor Michael Foster.*) Do you think that there is any evidence to connect the case in the Union Workhouse with the family in Abbey Street?—The only evidence of which I know is from the information of the sanitary inspector that this tramp had lodged in Abbey Street before going to the Union Workhouse and so he might have been the means of infection to others.

16,244. Does the Medical Officer state that at all?—He does not state that, but the sanitary inspector gave me the information from his private note book.

16,245. What was the case that was fatal?—The one from Gavin's Yard, aged three.

16,246. Perhaps, in order to know whether he was an inhabitant of Leicester, I may ask you is Gavin's Yard also a lodging-house yard?—Yes, it is a lodging-house yard. Perhaps I might be allowed to read the observations made in this report with regard to these cases. The one aged 3 is stated to have had confluent small-pox, the child was unvaccinated, but recovered. The one aged 10 was a confluent case, and there were two slight vaccination marks; this one recovered. The one aged 13 was also confluent, unvaccinated; that recovered. The one from the Union Workhouse is stated to have been confluent, vaccinated, one slight mark; that case also recovered; and the one from Gavin's Yard, that died, is described as confluent small-pox, unvaccinated. The case No. 42 is described as unvaccinated, confluent in type; and No. 43 is described as being a mild case having one good mark. Case No. 44 is described as being a mild case, two "imperfect marks." I have already read some part of the next year's report to explain this, and to show that there were eight cases. I will now complete what the Medical Officer has said at page 19 of the report for 1879.

16,247. (*Chairman.*) Is this a special report?—No, this is the ordinary report. In the year 1879 Dr. Johnston became the Medical Officer of Health, Dr. Crane having retired. There were no cases of small-pox in 1879. The only reference made to the subject is the one I have just read, and as it is very short I will read it again: "During last year" (that means the year 1879), "269 patients were admitted into the hospital, namely, 247 cases of scarlet fever and 22 of erysipelas." "The admissions in 1878 were in all 78, namely, 51 of scarlet fever, 8 of small-pox, and 19 of erysipelas." "The great increase observed in the admissions last year," that is, 1879, "may be partly accepted as an indication that the people are beginning to recognise more fully the advantages offered by the institution." "Of the total 269 cases, 18 ended fatally, and were all confined to the scarlet fever wards." That is all that I have in regard to the Fever Hospital for that year. The language used in the report is very vague, and great care is required to ascertain as to which year the figures refer. Then I turn to page 16 of the report for 1880. In his observations on the Fever Hospital the Medical Officer says: "The number of acute cases under treatment in the hospital at the close of the year 1879 was 29, during last year there were in all 283 patients admitted, showing an increase of 14 upon the number of admissions in 1879. Of these cases, 230 were suffering from scarlet fever, 47 from erysipelas, 5 from typhoid fever, and 1 from small-pox." Lower down, in referring to the case of small-pox, he says: "On the 18th February, last year, a tramp was sent in from the Workhouse suffering from confluent small-pox. This case, though most severe, made a good recovery and no other case of the disease occurred in the town." This case you will find tabulated at page 19, No. 56, aged 30, date of admission, February 18th, from the Union Workhouse, date of discharge, March 24th.

16,248. (*Professor Michael Foster.*) Do you know if in that case any quarantine was exercised over the Union Workhouse in which the case apparently appeared?—No quarantine at all was exercised in that particular year. In the report for 1881, page 14, the Medical Officer says, in treating of small-pox:

"Two deaths resulted from this cause, and both of these occurred in the Fever Hospital. On four distinct occasions this disease appeared in the town, but owing to immediate removal to the Fever Hospital at Freake's Ground, together with a thorough disinfection and lime-washing of the houses where the disease had shown itself, the further spread of the malady was arrested. The first occasion on which it appeared was the 6th of March, at 24, Hutchinson Street (father and daughter affected); the second time was on the 27th of May, in a lodging-house in Bedford Street (in the person of a tramp); its third appearance was on the 17th of August, in a lodging-house; that also was a tramp; the fourth, on the 18th of December, in the Union Workhouse." That would probably have been a tramp. "The prevention of the spread of the disease, in all these instances, must be regarded as highly satisfactory, and is a striking proof of the great utility of your hospital when early and complete removal of the sick is secured."

16,249. Were the two deaths deaths of tramps or of imported cases at all events?—The tabulation of these cases is at page 44 of the report. Of the two cases from Hutchinson Street the first one was aged 50, admitted on the 6th of March, suffering from confluent small-pox; this recovered.

16,250. The question I asked is whether the two deaths were deaths of imported cases?—There are two cases from Bedford Street, the first of which, I should think, would be an imported case.

16,251. Is this the one that is a tramp?—Yes. Bedford Street is near to Abbey Street, and is a lodging-house district.

16,252. (*Chairman.*) He says, "In a lodging-house, and in the person of a tramp"; that is one of the two who died?—Yes, then the other death is entered at the top of page 58; that is the one from the Union Workhouse.

16,253. (*Professor Michael Foster.*) Is that one also supposed to be a tramp?—Yes.

16,254. Both imported cases?—Yes.

16,255. (*Mr. Dugdale.*) Were they vaccinated or unvaccinated?—No statement is made as to their condition in that respect.

16,256. (*Chairman.*) Where is the sixth, which is not mentioned in the summary about small-pox. That only records five cases, two in Hutchinson Street and one in Bedford Street, one in a lodging-house and the other in the Workhouse; where is the sixth, I suppose we should get the sixth from this summary?—Yes, I think we shall.

(*Dr. Collins.*) That is No. 288 from the Desford Industrial School.

16,257-8. (*Chairman.*) That would make five distinct occasions instead of four; where is the Desford Industrial School?—It is an institution under the Leicester School Board; about eight miles outside Leicester.

16,259. Then it was not a case in Leicester at all?—Not supposed to have originated in Leicester, but it was brought to our Leicester Fever Hospital, because there was no other place for its isolation.

16,260. (*Professor Michael Foster.*) But this column includes cases brought to Leicester?—Yes, the third column of the table given on Diagram D. includes some cases from outside districts, so that this case would be included the same as the others.

16,261. (*Dr. Collins.*) I suppose if there were any other cases at the Desford Industrial School arising from this case they would have been brought to your hospital?—You may rely upon it that they would.

16,262. So that that case would not appear to have given rise to any secondary cases?—It does not appear to have done so.

16,263. (*Chairman.*) I should have thought from this table that the number would have been given as five instead of six; the Medical Officer only speaks of four outbreaks and five cases?—But in another report he deals with the whole number of importations, and mentions four as occurring in 1881, and he must have known all about it.

16,264. But he deals with four distinct occasions and five cases, not six?—Unfortunately we cannot know the whole of the circumstances of the Desford case. This



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might have been a child that was sent from the Leicester Workhouse a short time previously.

16,265. It strikes me that if you deal with it at all you must call it an importation, it does not arise within the town; the fact that the Leicester people pay for the Desford School does not make it the less an importation than if it had been brought from an industrial school for which they were not responsible?—But in a later report Dr. Johnston reviews the whole of these importations, and he mentions only four for that year.

16,266. But when he says there are four he is obviously excluding this one, because he tells you what the four were; he says, "Upon four distinct occasions this disease appeared in the town, but owing to immediate removal to the Fever Hospital at Freae's Ground, together with a thorough disinfection and lime-washing of the houses where the disease had shown itself, the further spread of the malady was arrested. The first occasion on which it appeared was the 6th of March, at 24, Hutchinson Street (father and daughter affected); the second time was on the 27th of May, in a lodging-house in Bedford Street (in the person of a tramp); its third appearance was on the 17th of August in a lodging-house (tramp); and the fourth, on the 18th of December, in the Union Workhouse." Now, this case that we are now speaking of occurred on December 7th; that is not one of the occasions he mentions?—The two cases occurring at Hutchinson Street would be inhabitants of the borough itself; and it is just possible that on a final review of the circumstances of these cases he would not regard them as importations.\*

16,267. (Professor Michael Foster.) That was a spontaneous outbreak of small-pox?—Yes, I should judge that the Hutchinson Street cases were, although from the passage read by his Lordship, Dr. Johnston at one time thought otherwise.

16,268. (Chairman.) Can you refer us to the passage in which he says the four cases were imported?—I shall come to that as I pass along.† Now in 1882 the Medical Officer says, at page 22 of the report: "During last year this disease appeared on several occasions in different localities in the town. On the 5th of January a case was reported in a house in Abbey Street. The patient and the other occupants of the house were removed without delay to the hospital, and the house was forthwith thoroughly disinfected by fumigation and lime-washing. There is no doubt, from inquiries made at the time, that the infection in this case was received from the person of a tramp who had rested for a few hours in the house and then left the town. On the 7th of January, in another lodging-house in the same street, three fresh cases were reported; these were all removed to hospital, together with the other lodgers, and the same means were employed for disinfecting the house as in the first case. A strict and daily inspection was kept up for some time after among the houses of the neighbouring streets. No fresh cases, however, appeared until the 18th January, when one was reported in Belgrave Gate. After the most careful inquiry nothing could be elicited to throw light on the source of this case. On the 23rd January two cases were reported in Wood Street" (that is in the same neighbourhood), "and on the following day three others appeared in different localities of the town, Royal East Street" (which leads out of Abbey Street), "Green Street" (which is close to), "and the Workhouse. Isolation and disinfection were carried out as before. Early in February three cases were reported in the gaol, and these were taken to hospital. Eight additional cases occurred before the end of February in seven different places in the town and neighbourhood. In March three cases were sent to hospital from New Humberstone and Belgrave; the source of the infection could not be discovered in these cases. In the months of May and June there was a fresh importation of the disease, when three navvies were reported

"as suffering from the disease in a house in Hampden Street. On the 15th of August another case came under our notice, and was removed to the hospital from the Workhouse, and from that time until the end of the year, the disease did not re-appear amongst us. Altogether there were 29 cases, and in most of these the complaint assumed the confluent type; five out of the total number proved fatal. It is now 10 years since the subsidence of the epidemic of small-pox which prevailed in Leicester during the year 1872, when it caused no fewer than 346 deaths. This is by far the longest period of such exemption from small-pox the town has ever experienced, and there can be no doubt that but for the prompt isolation of the cases as they appeared last year the town would again have been visited by a most fatal epidemic of this justly dreaded scourge." I do not think it necessary to refer to the tabulated list for those cases.

16,269. (Chairman.) It does not show any more, it only shows the 29 cases, as I gather?—It only shows the 29 cases.

16,270. (Professor Michael Foster.) Do you know what the five deaths were?—The first one recorded is case No. 20, at page 68.

16,271. Is that an imported case?—It is entered as coming from 11, Abbey Street, so I should judge it was. The child was aged 12, and it died; there is no remark as to whether it was vaccinated or not.

16,271a. (Chairman.) It evidently is, because it is the first case admitted?—Yes, it is an importation, no doubt. The next one is No. 91, page 71; that is from No. 2, Belgrave Gate; Abbey Street leads out of Belgrave Gate; this attack resulted in death.

16,272. But nothing could be elicited to throw light upon the source of that case he says?—No; the source could not be discovered.

16,273. (Professor Michael Foster.) But not one which had caught it from an imported case?—As far as the Medical Officer was able he could not trace it to a previous case.

16,274. (Mr. Bright.) There is no information, is there, as to whether those people had been vaccinated or not?—There is no information given here in the "remarks" column, and this is our only source of information.

16,275. (Mr. Picton.) Is it not always entered when they are unvaccinated?—I could not say it is always so, but I should think where occasion offered it would be seldom omitted.

16,276. It appears to be so. At the top of page 70 there is a case recorded as "unvaccinated"?—Yes; but it recovered, it was a child aged six months.

16,277. (Professor Michael Foster.) Is that an imported case?—It is a case from Wood Street, a street leading out of or near to Abbey Street. I could not say as to its being imported or otherwise. Then the next case is No. 147; that is from Belgrave, a district outside but contiguous to Leicester. There is no observation made as to whether it was vaccinated or not. The next one is No. 187; this is from Hampden Street, a navy.

16,278. Therefore imported?—Yes, he was a man who had recently come to work at Leicester, therefore it was an imported case. It is entered as "aged 32, died, unvaccinated."

16,279. (Dr. Collins.) And No. 193?—No. 193 was a case, aged 32, also a navy from 5, Hampden Street, died from malignant small-pox; no statement is made whether vaccinated or unvaccinated. I do not think it would be an unfair assumption to say that all those were vaccinated who were not otherwise entered.

(Chairman.) I thought at first it might be when I saw one marked unvaccinated, but when I see one marked vaccinated I cannot follow that. I think there is no one marked vaccinated who died in this year.

16,280-1. Of course it may be that some of them came in in a condition in which they could not tell or did not observe it. Are there no observations about it in the body of the report?—I cannot trace any at all.

16,282. Was it the same Medical Officer, because in the previous report this point is minutely dealt with in each case?—Yes, it is the same Medical Officer, Dr. Johnston.

16,283. I do not mean the Medical Officer of Health, but the Medical Officer at the hospital?—The Medical

\* By reference to the hospital "case-list," beginning at page 43 of the Medical Officer of Health's report for 1881, it appears there were really seven small-pox cases admitted in all during that year; namely, Nos. 48 and 49, from Hutchinson Street; No. 67, no address given; Nos. 103 and 209, from Bedford Street; No. 288, from Desford Industrial School; and No. 433 from the Union Workhouse. This shows that Dr. Johnston, in the paragraph quoted in question 16,265, has omitted to mention a case, No. 67, admitted to hospital on March 26th. Dr. Johnston evidently did not regard, or at any rate does not mention, the Desford case as an importation.—J.T.B.

† It will be found at page 31 of the Medical Officer of Health's report for 1883.—J.T.B.



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Officer of Health is also the Medical Officer at the hospital, and at the time Dr. Johnston resigned one office he necessarily resigned the other. Both offices are held conjointly by the same medical man. In the report for 1883, at page 28, the Medical Officer, speaking of the compulsory notification of infectious diseases under that heading of small-pox, says: "The history as to the stamping out of small-pox in 17 distinct importations of the disease, given in the succeeding chapter, is conspicuously noteworthy among the proofs of the advantages attending notification." Then in the next chapter, under the heading of small-pox, at page 29, he refers to the 5 importations and 12 cases of small-pox. He says: "During the year 1883 12 cases of this disease were received into the Borough Fever Hospital. Three of the patients came from the county districts (Barrow and Goadby)"—both places are about 10 or 12 miles distant from Leicester—"and the remaining nine occurred in the town. The first of the town cases, a girl in one of the canal boats, was reported on the 23rd February; she was at once removed to the hospital, and the remaining persons in the boat were placed in quarantine. A fresh importation of the disease was reported on the 13th of June in a house in Abbey Street. The patient was forthwith removed to hospital and the remainder of the family consisting of the mother and four children, were quarantined. The mother and one of the children on the 11th day of admission sickened with the disease and were at once transferred to the proper wards. Another case, arising from the above, appeared on the 1st July in another house in Abbey Street. No other case came under notice until the 16th July, when a woman was reported as suffering in Wright Street, the source of which I was unable to discover." Wright Street is nearly a mile from Abbey Street. "On the 27th of July a young woman aged 21 years, living at 52, Argyle Street, was attacked with the malady, and from inquiries I made as to the origin of her illness it was found that while on a visit to her mother, who was engaged in some capacity at the Small-pox Hospital at Birmingham, she was given a brown linen dress to wear when she returned to Leicester. This she did, with the result that at the end of a fortnight she was prostrated with the disease in its most virulent form, and succumbed to it on the 6th August. On the 31st August two additional cases, having as far as could be ascertained no connexion with the previous one, were reported in Argyle Street, making the fourth and last importation of the disease into the town during the year. Of the 12 cases admitted, three ended fatally, all of whom were unvaccinated. Of the nine recoveries, seven were vaccinated and two unvaccinated. In only one of the seven vaccinated cases had primary vaccination been performed efficiently—this patient had three good marks. In no instance had re-vaccination been had recourse to."

16,284. (*Professor Michael Foster.*) Were those three deaths imported cases?—I am unable to say whether all the three deaths were those of imported cases, as no tabulated return is given for this year.

16,285. (*Dr. Collins.*) One must have been the woman from Birmingham—she succumbed?—Yes, that is one no doubt, but no statement is appended at the end of this report as to which cases died. Dr. Johnston then gives a return of small-pox cases, similar to the one I alluded to in the previous report, which I need not read as the figures have been already presented to the Commission; but speaking of these figures which give the deaths from small-pox from the year 1852 to the year 1883, a total of 32 years and 642 deaths, he goes on to observe, at page 30, that "From these figures it would appear that from the year 1852 to 1872 the disease gained an epidemic prevalence, attended with high proportionate fatality, on no less than four occasions, the intervals between the acme of each visitation ranging from five to seven years. Indeed, there is a striking regularity to be seen in its visitations during the 21 years referred to. It may also be observed from the return given above that since 1873 up to the present time—an interval of 11 years—the town has enjoyed an almost complete immunity from the inroads of the disease. In the last seven years there have been no fewer than 17 importations of small-pox into the town, viz.: (a.) In the year 1877 there was one importation, and the disease appeared in six separate localities, but all traceable to the imported case, before its final arrest." So that I should

think that some information came into the possession of the Medical Officer after he had written his report which confirmed him in the statements he had previously made. "(b.) In 1878 two importations occurred, and in one instance affected two houses. (c.) In 1880 one importation was reported, but no extension occurred. (d.) In 1881 four importations were reported, each unattended with extension. (e.) In 1882 there were four further importations, in one of which the disease extended to 14 different localities before it was subdued. (f.) In 1883 five importations were reported, and in one instance affected two houses. Notwithstanding this large number of importations the disease has always been stamped out, and the town thus saved from the distress and mortality which have hitherto accompanied its prevalence. In the following statement are shown the deaths recorded from small-pox in 11 of the large towns since the time of our last visitation in 1872." That I do not think I need read unless your Lordship wishes it. He then goes on to observe: "The continued exemption from small-pox experienced in Leicester under so many instances of its importation is highly satisfactory, and is altogether due to the success which has hitherto attended the efforts of the health committee in securing not only the immediate reporting, but also the prompt removal to hospital of all the cases as they come under notice. A review of the facts here stated will offer to most minds conclusive proof that if health authorities throughout the country could only secure the removal and isolation of initial cases of any of the essentially infective fevers, the excessive mortality now annually arising from them would rapidly be reduced to insignificant proportions when compared with the fatality from other classes of disease." The Commission will see from this extract that not a syllable is uttered respecting vaccination, but that our exemption from small-pox epidemics is entirely attributed by our Medical Officer of Health to the efficiency of our sanitary measures; an opinion with which I heartily concur.

16,286. It was having regard to the information contained in the Medical Officer's report for 1883, page 31, which induced you to fill up the importations for 1877, 1878, 1880, 1881, and 1882 in your first column in the table of Diagram D. as you have done?—Yes, and also for 1883.

(*Chairman.*) But it suggests a little doubt to my mind whether importations there does not mean outbreaks. For example, his view might very likely be this: that they must have taken it from somewhere, and that, therefore, when this case broke out in Hutchinson Street, seeing that it must have come from somewhere, and as the people were residents, therefore it must have come from outside.

(*Professor Michael Foster.*) That though there were two cases he would count that as one importation.

(*Witness.*) There is no doubt he did count the two cases in Hutchinson Street as one importation. That might be explained by a reference to a fact which is mentioned in a further report of a Leicester man working in Warwickshire and bringing the infection from Warwickshire. Possibly this man in Hutchinson Street (that being an artisan district) might have been working outside.

16,287. (*Dr. Bristowe.*) Should not your third column be "Small-pox treated in hospital, including cases brought from the country districts without Leicester"?—The third column of the table given on Diagram D. is, I think, sufficiently explicit, especially when taken in connexion with the other information given with the table. It would simply be an amplification of the heading.

16,288. You mentioned just now that three of the cases were brought from a place 10 miles outside, so that it is quite clear that all those cases in that column, exclusive of those in the second, could not have been contracted from those imported cases?—The three cases brought from districts 10 miles outside Leicester were importations, and are tabulated as such in column 2 on the authority of the Medical Officer of Health, whose remarks will show how far he regarded them as centres of infection.

16,289. It would make it more correct, because it creates a wrong impression at present?—But it says upon the heading of the diagram "Diagram showing the total number of small-pox cases which have oc-



"curred in and near Leicester since the subsidence of the great epidemic of 1871-73."

16,290. There may have been importations from the districts around Leicester of which you may know nothing?—They would have found their way to the Fever Hospital and be included here if they came from any of the districts immediately around Leicester.

16,291. (*Mr. Bright.*) The districts all round Leicester depend upon Leicester for their fever hospital?—Yes. I believe ours is the only hospital for infectious diseases in the county of Leicester, certainly the only one for many miles round.

16,292. (*Professor Michael Foster.*) They are obliged to. A case in one of these outside district could not be left to go through its illness there, they would have to come to the hospital, would they not?—I do not think they would be obliged to, unless they had no provision for isolation.

16,292a. Then it must be, as Dr. Bristowe suggests, that there might be many cases of small-pox outside Leicester other than this table would show?—I do not think that this follows, because there are only three Unions immediately surrounding us, Barrow, Billesdon, and Blaby Unions, and I know for a fact that all these Unions send their cases to the Leicester Hospital, having no infectious hospital of their own.

16,293. But as this heading reads here this table states the total number of small-pox cases which have occurred not only in Leicester but within a certain radius from Leicester?—Yes.

16,294. Apparently from what you said there may have been cases which took place within that radius which would be ignored altogether by the information upon which you depended for the formation of this table; that is to say, cases not brought to the infirmary or hospital, but which went through their illness privately?—If so they would be cases of which even the Medical Officer would have no cognisance whatever; we cannot tell what cases may be dealt with privately; we can only deal with those facts which come to our knowledge.

16,295. (*Chairman.*) At that time was there any compulsory notification in Leicester?—The Act was passed in 1879.

16,296. So that after 1880 all cases of this kind ought to have come under the knowledge of the Medical Officer?—Yes; and I should think in all probability they did.

16,297. But a case that was dealt with at home would not necessarily have come to his knowledge?—No, not if it were dealt with entirely at home.

16,298. (*Professor Michael Foster.*) In that case they would not be reported. "Occurred" means "Which have taken place," but with you it means simply those which have been "Recorded by the Medical Officer"?—I do not know that the heading can be taken to be inexact in any sense whatever.

16,299. (*Chairman.*) Yes, because what Professor Foster puts to you is that if cases may have taken place without any knowledge of them coming to the Medical Officer it is not correct to say that this table gives the total number of small-pox cases which had occurred in or near Leicester during those years, because you admit that many cases may, for aught you know, have occurred which will not be within that total?—I do not admit that many cases have occurred which are not included there.\*

16,300. Some cases?—I think if there had been any cases some information would have come to the authorities about them.

16,301. Of course if you had had an epidemic that would be so, but when we are dealing with small numbers of cases, such as two, three, and four, there might have been two or three cases dealt with privately without the Medical Officer knowing about them?—I think the probabilities are quite in the opposite direction, because this question of the treatment of small-pox has assumed such wide proportions in and about Leicester.

16,302. But in dealing with statistics we deal with facts, not with probabilities?—With great deference

to the Commission that is just what I am dealing with, namely, ascertained facts.

16,303. No, you are professing to give the total number which occurred; when you admit that you have not the means of giving it with absolute certainty?—I am not aware of having made any such admission. If any cases occurred in private of which there was no knowledge conveyed to the Medical Officer we should have no means of knowing them.

16,304. Your attention has been called to this: do not you think as a matter of accuracy that this would more accurately have been headed, "Total number of small-pox cases in and near Leicester which have come to the knowledge of the Medical Officer since the subsidence of the great epidemic"?—Yes, no doubt that would be so.

16,305. (*Professor Michael Foster.*) This is not exact, and it leaves one in the condition of not knowing how great your error is, except that it will not be so great as to attract public attention?—So far as Leicester is concerned, there is no doubt it is absolutely accurate; but then we have three districts adjoining Leicester, all of which are in friendly relation with the sanitary authority of Leicester, and which have been in the habit for many years of sending their cases of infectious disease to Leicester, and if any other cases had arisen in these districts they would doubtless have been sent.

16,306. (*Chairman.*) But surely for the purpose of a statistical table of this kind it would be better to exclude the districts altogether and confine it to the borough of which you have accurate knowledge?—We have confined it entirely to those of which we have as accurate knowledge as anyone can possibly have, both for the borough and outside.

16,306a. But you do not follow me. As to the borough you have accurate knowledge of all cases since 1879 presumably; if you do not hear of them then they do not occur, but you cannot infer that for the districts without the borough. You might make a separate note that in the hospital in any one particular year there were certain cases which came from outside the borough?—The same possibilities exist for the borough as for the outside districts; but as I give the whole of the details, those that are outside can be easily separated from the others.

16,307. (*Dr. Collins.*) Your Notification Act came into operation in September 1879?—It received the Royal Assent on the 11th August, 1879.

16,308. Any case of small-pox which has occurred within the area to which the notification relates and which has not been notified since that date has been unnotified illegally?—Yes, that is so.

16,309. In order to complete your table I understand you have referred for information to the returns of the Medical Officer of Health?—The table is compiled from his official returns.

16,310. Going through those returns you find in addition to the cases within the borough of Leicester certain other cases which have come from districts near Leicester?—Yes; and these are a sufficient proof to my mind that those other districts did report their cases of small-pox.

16,311. Have you consequently amended your heading, adding the words "near Leicester," to meet those particular cases?—Yes, I framed the heading of Diagram D. purposely to include districts "near Leicester."

16,312. Have you any objection to altering your paragraph No. 1 of your heading to make it read "Total number of small-pox cases in or near Leicester which have come within the knowledge of the Medical Officer" since this date?—None at all. There would be no difficulty about that, so long as it is not understood to imply that there were actually cases which did not come to the knowledge of the Medical Officer of Health.

16,313. (*Mr. Picton.*) If the law has been put into operation you have all the cases which have occurred in the borough since 1879?—Yes, there is no doubt of that.

16,314. And in addition you have all cases which have been reported from outside?—Yes, and all that have been heard of in the neighbourhood.

16,314a. (*Chairman.*) Unless there is any good reason to suppose that those cases brought from outside affected the borough, that is to say, that the people of

\* I do not know that there are any such cases; and before it can be alleged that the heading is incorrect it would have to be proved that such cases had actually occurred.—J.T.B.



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the borough took their infection from those cases, would it not be best to exclude them, and then you have the cases arising in a community in which you know all the cases?—But in the majority of these cases the infection has come from districts outside the town, so that the various cases which have arisen in the borough have received the infection from the cases so imported.

16,315. If a man takes the disease in the town I regard him as being fairly within your description, wherever he got it from; but taking people outside (I am taking the Desford Industrial School and Humberstone), would it not be better to eliminate them altogether?—I do not think it would, because they are treated at our Borough Hospital; and so much interest has been excited all over the country respecting Leicester and this particular subject that I think it is necessary to show in how many instances we have run the risk and danger of having the disease brought into the town.

16,316. You are speaking there of the risk you run in having small-pox patients brought to your hospital from the outside?—Yes, of the risk of infection which would be brought to the town in a great many of these instances.

16,317. (*Mr. Picton.*) Is not the point of this Diagram D. to show how Leicester as a municipality has dealt with the infection of small-pox within its own borders?—That is what I am endeavouring to illustrate.

16,318. That isolation has been successful in stamping out the disease?—Yes, eminently successful in connection with the other sanitary means used.

16,319. You do not propose to show anything as to the country districts?—Not at all, as to what is done there, further than to show that we deal with their small-pox as well as our own.

16,320. (*Chairman.*) But you do. In order to show how Leicester has dealt with and prevented disease by isolation you include cases which it has invited from outside, and so increased the risk of infection. How does that help your case for isolation? If you exclude them as regards amount of small-pox I cannot see how it throws light upon your system of isolation inside the borough?—I think it helps the case immensely for our system of isolation, because if we are able not only to deal with the cases inside the borough, but with those outside, it proves the system to be very much more efficient than if we dealt with the borough cases alone.

16,321. How far is the hospital from the boundary?—It is 500 or 600 yards from the present boundary of the borough, but it will be incorporated when the Leicester Extension Bill is passed.

16,322. (*Sir James Paget.*) Do you think that the danger of taking a patient from the out-district to the hospital is as great as letting a patient with small-pox come and reside in the town?—Certainly not.

16,323. Then they are not a risk to the town if they are sent from the adjacent county to the hospital 500 yards from the town and are there isolated?—But most of these would have to pass through the town.

16,324. That depends upon which side they come from, does it not?—Yes, but I think they would in most cases be bound to pass through some part of the borough, unless they were taken a great distance round.

16,325. But that would not be so great a risk as allowing them to remain in the borough for 12 hours?—Perhaps not, but I do not think we need differentiate the risk in regard to time.

16,326. (*Sir William Savory.*) Under the head of "Whence imported," do you give the Commission all the information you have with regard to the places from which they came? When you say "by a tramp," do you know where he came from?—No, not in every instance; the information tabulated in column 6 is taken wholly from information obtained by the Medical Officers themselves, and published in their reports.

16,327. You have no information beyond that?—Not beyond their information, and some from the sanitary inspector who removed the cases to the hospital.

16,328. I hardly see how you are justified in making the statement that most of these cases are due to importations from efficiently vaccinated towns and districts. The statements do not seem to me to show that most of the cases were due to importations from efficiently vaccinated towns and districts?—If you will

count up the number of importations and look at the names of the towns I think you will find my statement justified.

16,329. I tried to do that and I did not get a majority. There is "Birmingham, occupants of canal boat and country districts." You do not know whether the occupants of the canal boat or those from country districts are from efficiently vaccinated districts?—If you go outside Leicester —

16,330. But this is Birmingham?—That is outside Leicester.

16,331. You say you do not know anything further than what is quoted in this table, therefore you would not know where those who belonged to the canal boats and the country districts came from?—If they came from almost anywhere outside Leicester they would come from well vaccinated districts.

16,332. You see opposite the year 1882 you have the comparatively large number of 29 small-pox cases?—Yes, cases arising from importations.

16,333. And your remark on this is "By tramp and others"?—Yes, they would come from some other town.

16,333a. (*Mr. Picton.*) But there are only four importations?—Yes, only four, but these are quite sufficient to infect all the rest.

16,334. (*Sir William Savory.*) But you state that most of the cases were due to importations, and even if you take the importations themselves I do not think a majority would come out?—The whole of the cases I put down as being due to importations on the authority of the Medical Officer of Health.

16,335. (*Chairman.*) You assume that everybody who comes from anywhere except Leicester comes from a well vaccinated district; what is your ground for saying that?—I do not know that that is necessarily assumed, because there are official returns proving it to be true, excepting for some towns like Keighley which I should not regard as a well vaccinated place.

16,336. But when you do not know from whence the tramps come you assume that as most places are well vaccinated they must come from a well vaccinated district?—That is so; but I do not think that can be said to be an assumption, because the vaccination returns prove it to be a fact.

16,337. That is assuming it, although your assumption may be well founded, is it not?—Yes, if you choose to put it in that way, but in my judgment a well-founded assumption is equivalent to a fact.

16,338. (*Dr. Collins.*) I notice that five of your importations are from Sheffield; are you aware that Dr. Buchanan has stated in his memorandum to Dr. Barry's report that Sheffield had obeyed the Vaccination Acts rather better than the average of large towns?—Yes, I am aware of that.

16,339. (*Sir William Savory.*) Are you aware whether the people who brought small-pox into Leicester were vaccinated or not?—With regard to most of them, the Medical Officer gives no information at all. There was only one year dealt with specifically.\*

16,340. (*Dr. Bristowe.*) Most people coming from Sheffield and London are put down as tramps?—Yes, when they are tramps.

16,341. So that a great many of those coming from presumably well vaccinated places were tramps, were they not?—Yes; but of course it depends upon who they were.

16,342. Tramps are not generally a well vaccinated class of people, are they?—That I could not answer, but I do not know why we should assume they are not a well vaccinated class.

16,343. (*Chairman.*) Further than that, you could not quite assume, could you, that the place where a tramp came from was the place at which he had been during his vaccination period?—I fail to see how that would affect the question. There are only two specific cases of tramps given, and in both those cases I can show that they were vaccinated.†

16,344. But if a man came from Sheffield, though he was a tramp, that does not show that he was a Sheffield

\* There is strong probability that most of them were vaccinated, for had it been otherwise the Medical Officer of Health would undoubtedly have recorded the fact.—J.T.B.

† See the Medical Officer of Health's report for 1886, page 10.—J.T.B.



man?—Not necessarily so, but he might bring the infection from Sheffield nevertheless.

16,345. (*Sir Guyer Hunter.*) What do you mean by “an efficiently vaccinated town,” what is the inference you wish us to draw?—I am using here the term which is commonly used by believers in vaccination, and an observation made by Dr. Buchanan in regard to Sheffield.

16,346. Then Dr. Buchanan, I suppose, stated what he meant by an efficiently vaccinated town; what do you mean by it?—I have used a term which one finds in use by medical gentlemen in regard to vaccination. I consider that Leicester was efficiently vaccinated before the epidemic broke out, and taking medical opinion as my guide in this matter, I should judge that if the population of any district were vaccinated to the extent of some 90 or 95 per cent. it might be regarded as efficiently vaccinated.

16,347. Then these people were taken from the population of towns where the population was vaccinated to the extent of 95 per cent.?—There is no doubt they were, assuming the official vaccination returns to be accurate.

16,348. (*Chairman.*) Have you any materials before you which would enable you to note the cases included in the third column which were simply cases brought to the hospital from the out districts?—I have not yet abstracted that information, but it could be tabulated from the returns.

16,349. I should be glad if you would do so, because although it does not strike you as being very important it would be important to us that we should get that; that is to say, those who are included in the number, not because they were in the hospital, but who were brought with the disease upon them to the hospital?—Yes; I will prepare a table containing the information for which you ask; you would not, I suppose, include the tramps?

16,350. No, I am speaking simply of those whose destination was the hospital?—Yes, that is to say, those from Barrow and other places outside.

16,351. (*Dr. Collins.*) I understood you to say that you included such cases, or thought it desirable to do so, because although there might be a very slight risk there might possibly be some risk of infection in carrying cases through the streets of Leicester?—Yes, that was my object; but I will get full information respecting all the cases referred to in the table on Diagram D.

16,352. Are you aware that in the Royal Commission on Hospitals it was stated that infection had arisen owing to the mode of transportation of small-pox cases to the hospital?—I am not aware of that particular statement, but I am aware that the existence of the Winter Street Hospital in Sheffield was regarded as a serious source of infection.

16,353. (*Chairman.*) What strikes me is this, that if there is no evidence to show that anybody in the town was affected by those people being brought to the hospital, I do not see what your system of isolation had to do with it, because it did nothing to prevent it. Your system of isolation deals with people in the same house with those who have the disease; but your system of isolation would not in any way diminish such risk as there was of people brought to the hospital from an outside district communicating the disease to somebody else?—But other persons were brought in with those cases who were placed in quarantine, having been in contact with them.

16,354. You think that in that way it would render it less likely that the disease would spread in the districts outside the town?—Yes; the full number of persons placed in quarantine does not appear in the reports, but I have had some conversation with Inspector Braley who carried out most of these matters, and I propose reading to the Commission information he supplied me to that effect.

16,355. (*Dr. Collins.*) Although the inclusion or exclusion of these cases may have but a slight bearing upon the Leicester method of isolation, I put it to you whether you have included these cases, as possibly they might have some bearing upon the neglect of vaccination in Leicester, as increasing, or otherwise, the risk whether it be great or small?—Yes, I included them for this reason: that it is frequently stated that we are running an enormous risk in Leicester, therefore I wished to include the most infinitesimal risk as well as the larger risks of cases arising in the town.

16,356. (*Chairman.*) But inasmuch as it is a risk of a totally different nature and kind it is better dealt with by our seeing what the amount of the one is, and what the amount of the other is, and not lumping them together; not that you should exclude them, but that you should show them separately?—I shall be quite willing to put in a table showing them separately.

16,357. (*Dr. Bristowe.*) I understood your third column was simply abstracts from the Medical Officer of Health's returns?—Yes; and there is no reason that I am aware of to doubt its accuracy.

16,358. (*Chairman.*) You have not yet shown me the passage which gives your reasons for showing 12 cases only if you put down six cases of death in 1877?—I am not aware that I have stated that there was a passage referring to that.

16,359. Yes; I called attention to the fact that the Medical Officer said that there were five deaths out of the 12 cases, and that he rejected the sixth recorded death as not being really from small-pox. What was suggested was that if you added in that sixth death you must add one to the number of cases to make them 13. I understood you to say that a subsequent report showed that that ought not to be done?—What I meant to say was this, that although Dr. Johnston originally stated that one death should be eliminated he includes it in all his subsequent tables, making the number of small-pox deaths six for 1877. It is therefore possible that after writing the report for 1877 Dr. Johnston found sufficient reason to retain the number as six. You will also see from the extract I have just read from the 1883 report that Dr. Johnston does consider it as a case of small-pox; in fact he enters the deaths as six in each of the three tables contained in the report for that year, and this is where I took it from. Continuing my reading of the extracts, in 1884 the paragraph which occurs in the Medical Officer's report at page 37 reads as follows:—“No fatal case of this disease was recorded last year, but three distinct outbreaks were reported in the town and neighbourhood, and in each instance the infection was conveyed from London. Owing to the immediate removal of all the inmates of each house where the disease appeared to the Fever Hospital at Freae's Ground, together with the thorough disinfection and lime-washing of the infected houses, the further spread of the disease was arrested. The first occasion on which it appeared was on the 11th April in a house at Wanlip.”

16,360. Where is Wanlip?—About five or six miles outside the town. “Three persons, all inmates of the same house, were attacked. The second appearance was on the 22nd August in a house off King Richard's Road, and here two persons contracted the disease. It was again imported on the 28th November by a young man living in the neighbourhood of High Cross Street, and in this instance the disease did not extend to any other member of the family. During the last eight years there have been no fewer than 20 importations of small-pox into the town and its immediate neighbourhood. The disease has, however, always been stamped out owing to the fact that the health committee have always succeeded in promptly removing to hospital, not only those stricken with the malady, but also all the other inmates of each infected house.” No list is given at the end of this report as to the particulars of the individual cases. This is the last report by Dr. Johnston.

16,361. (*Sir Edwin Galsworthy.*) Within what period were those cases removed after they had been notified?—Immediately on notification.

16,362. What do you mean by “immediately”?—I will just read, if you will permit me, in answer to that, some notes made by the sanitary inspector who attends to the removals. This is a letter from Inspector Braley as to the action that he takes in cases of small-pox, he says: “When a case is reported I at once go to the infected house, and try to ascertain where the disease was contracted, where the patient has been working, where he has been visiting, and his movements generally for the last 10 or 12 days. I also make a point of seeing all persons who have visited the infected house during the time stated; in addition I visit all factories and workshops where other members of the family have been employed; and by this means have been able to get cases removed when the first symptoms of the disease appeared. Immediately on the removal of the patient I superintend the fumigation of the house

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"with sulphur; liquid disinfectants are also freely used in the drains and about the yard, and the ashpit emptied and disinfected; the next day the bedding is taken to the disinfecting chamber and subjected to the hot air process. Up to the present time I have succeeded in persuading almost every person connected with the infected houses to go into quarantine. In a very few cases only I have experienced opposition. Usually the medical men in a critical case of small-pox would not wait to send the ordinary notice by post, but would personally acquaint the Medical Officer of Health or the sanitary inspector."

16,363. (*Mr. Dugdale.*) Is the sanitary inspector himself vaccinated?—Yes, he has been vaccinated. He further states: "Carbolic acid, Jeye's, or other liquid disinfectant is used, and carbolic powder for the drains and dust receptacles. The bedding is saturated with steam and then dried by application of hot air up to 220° Fahrenheit. Previous to 1872 the inspectors used to wait for complaints to be sent to them. Now they thoroughly inspect the town and go out to the houses where the complaints exist."

16,364. (*Sir Edwin Galsworthy.*) Do I understand that those cases are removed in special ambulances for the purpose?—Not in one kept for small-pox cases only. There has hitherto been only one ambulance; but we have bought a new one recently. The same ambulance is still used for small-pox as for any other case.

16,365. When you say "as for any other case," do you mean for fever as well as small-pox?—Yes, for scarlet fever, and for all similar purposes.

16,366. Is it disinfected after the removal of each case?—It is disinfected after the removal of each case, whether of small-pox or other infectious disease.

16,367. Do you consider that there is any risk whatever from those ambulances passing through the streets of Leicester?—That I cannot say, I only know that risk has been attributed to that source. I remember reading a statement upon that particular point to this effect: that when a case of small-pox broke out in Leicester it was at once removed, and during its removal through the town it was surrounded by a cordon of vaccinated and re-vaccinated officials, for what purpose I do not know, apparently to keep people away.

16,368. (*Sir Guyer Hunter.*) Is not that true?—No, that report is not true, but many such reports have been circulated.

16,369. (*Sir James Paget.*) Do you think there is no risk in transferring a patient by a well-constructed ambulance carriage thoroughly disinfected from previous cases?—I should not think there was much.

16,370. Then is it fair to include in this list cases which have been brought from outside Leicester as introducing a risk owing to passing through the town?—There is not so much risk in passing a patient through the town from outside districts, as there is in the case of our borough officials coming into contact with them and then spreading the infection.

16,371. But the officials would be vaccinated, would they not?—Some of them are; but it will be admitted that even they can convey the contagion to others. This risk is, I think, too often ignored.

16,372. (*Dr. Collins.*) Are they re-vaccinated?—They were not all of them re-vaccinated at that time.

16,373. (*Sir Edwin Galsworthy.*) These ambulances are never allowed, I take it, to stop upon their way?—Stopping would not be allowed if it were known, although it might occur.

16,374. (*Chairman.*) You are going now to the year 1885, I believe?—Before reading from the report for 1885 I may mention that I am unable to find the particular paragraph I referred to in Question 16,367, but I believe it was published in the "Newcastle Chronicle." I should like, however, to read a similar quotation from the "Lynn Advertiser," dated May 9, 1891. There had just been a discussion at the Board of Guardians as to whether they should carry out compulsory vaccination or not, and these are the observations of the chairman.

16,375. (*Sir William Savory.*) Who is the chairman?—Mr. C. H. Ayre.

16,376. (*Chairman.*) Has this to do with the Leicester statistics?—It has reference to the particular point we are on now. He says: "If they were to remain so" (that is to say, if Lynn was to remain an unvaccinated town), "that was to say, if they were to treat the sub-

ject as Leicester did, then it was only right they should adopt the same precautions as were taken at Leicester. Leicester was an unvaccinated town, but he believed the people there lived in a very nervous state. He held in his hand a letter from a gentleman holding an important official position in Leicester, showing the means that were adopted for the purpose of isolation. Some little time back Mr. Brown described Leicester as being covered with gunpowder and a spark would ignite it. Lynn was strewn to a greater extent with gunpowder than Leicester, because ships from all parts of the world came to Lynn. Ships came here from Turkey and other parts where very little attention was paid to vaccination, and he was sure a spark would take more putting out in Lynn than it would in Leicester, and there would probably be more sparks. In Leicester they had an isolation hospital entirely devoted to small-pox" (which is untrue). "They had also an inspector with a large staff of officials under him with vans and horses in readiness, and as soon as a case of small-pox broke out, it was almost immediately removed to the infectious hospital, and the house of the person so affected was put in charge of an inspector. Other inspectors then searched round the neighbourhood to find out who had been in communication with this person, and when found out they were persuaded to go into quarantine for 14 days, and their expenses were all paid." He then goes on to suggest that they should adopt at Lynn the same system as he supposes was carried out at Leicester. I refer to this to show that the impression seems to prevail that we go to an enormous expense to carry out our special and particular method in Leicester. The idea suggested by these inflammatory statements is not only absurd, but is absolutely untrue. We have only three sanitary inspectors, all told; the one who has carried out these measures up to the present, almost alone, is Inspector Braley, and we have only one horse and one ambulance van for all purposes. Before passing from Dr. Johnston's reports to those of Dr. Tomkins I might add that I tried to ascertain one point which is rather important upon this branch of the subject, as to the vaccination or re-vaccination of persons placed in quarantine, and for this purpose I paid Dr. Johnston a visit. At the time I visited him, which was at the latter end of 1890, he was unable to give me any distinct information. He said he would think the matter over, and I addressed this letter to him upon the 13th of December: "Perhaps you will remember that some time ago I called upon you with Mr. Leeson, ex-chairman of the Board of Guardians, to inquire whether you could give me any information respecting the vaccination or re-vaccination of persons placed in quarantine at the Fever Hospital during the time you were Medical Officer of Health. No reference whatever is made to this in your annual reports; and at our interview you stated that you had no definite recollection as to what practice you followed, although you were under the impression that some of them were vaccinated or re-vaccinated. I write to ask whether anything further has come to your knowledge which will now enable you to give me definite information on this point. I may add that it is expected the Leicester evidence will be required by the Royal Commission soon after the re-assembling of Parliament in January next.—Yours truly, J. T. Biggs." In reply to this, Dr. Johnston sent me a letter, dated December the 15th, two days afterwards, as early as he could possibly reply: "Dear Sir,—I remember the conversation I had with you and Mr. Leeson about my method of dealing with persons received in quarantine at the Fever Hospital. On several occasions the quarantined people were vaccinated or re-vaccinated in cases where I deemed it likely to be essential. I never pressed the people to submit themselves to the operation when there was a manifest disinclination on their part, feeling as I did that these poor people by quietly agreeing to a compulsory isolation had sacrificed enough without having a fresh infliction imposed upon them.—Faithfully yours, Wm. Johnston." That was all the information which I could obtain from the late Medical Officer respecting the vaccination or re-vaccination of persons in quarantine during his period of office. I thought I had better quote this before leaving the subject of his reports. Dr. Johnston resigned in 1885, and Dr. Tomkins was appointed as Medical Officer, and in his report for 1885, at page 25, Dr. Tomkins refers to the hospital. He there says: "Leicester has for some years been provided with a hospital, such as it is,



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"for this purpose, but unfortunately it belongs to that class of structures which until the last few years has too often obtained in other towns. Intended at first as a more or less temporary building, constructed hurriedly and on an ill-designed plan, it may not inappropriately be termed an ugly makeshift." I have here a plan of the hospital which the borough surveyor prepared for me.

16,377. Do you put that in to show how good it is, or how bad it is?—I did not propose to put it in at all, I only exhibit it in order that the Commission may see the plan of the structure. The report goes on to say: "Having, however, been partly covered externally with corrugated iron it has withstood the wear and tear of 12 or 13 years use better than many others constructed entirely of wood. Erected originally to meet an outbreak of small-pox it consists of five blocks, three containing one large ward each, and the other two only partially divided, and provides but unsatisfactory accommodation for the treatment of small numbers of patients, or for the convenient separation of such cases as it may be desirable to isolate from others. It is also in many respects deficient in the accommodation and arrangements adopted in modern hospitals of this description. Further, it is entirely without such small wards as might be set apart for the reception of patients of a better class, and who might be willing to avail themselves of such accommodation on payment of the usual charges, if such accommodation existed. Nevertheless, with all its imperfections, the Borough Hospital has during the past year done good service; no fewer than 958 patients have been under treatment there, the bulk of them suffering from scarlet fever. During September and October a special effort was made to get as many of these patients into hospital as possible, with the result that some 80 per cent. of the total number reported at that time were removed there; the wards were thus occupied to their utmost capacity, the number of inmates reaching upwards of 180, and for a short time cases had to be refused admission which would otherwise have come. This led to the committee extending one of the blocks, and completing some other parts of the structure which had never been finished, and thus increasing the accommodation by some 20 beds." I inquired as to the refusal of admission to some of those patients and I found that the cause was that some part of the hospital was undergoing repair at the time of its extension, but that this only occurred during a very few days.

16,378. (*Sir Edwin Galsworthy.*) What is the cubic space allowed each patient in that hospital?—I could not tell you that.

16,379. (*Chairman.*) What do you read this for. I do not quite follow the bearing of it?—I want to show this, that although our hospital is inadequate in the opinion of our Medical Officer, and we think so too, yet at the same time it has enabled us successfully to deal with small-pox during a great number of years, and we are of opinion that if the system were applied in a more efficient building it would be even more effective if possible in the future than it has been in the past. The only paragraph relating to small-pox occurring in this first report of Dr. Tomkins, who was appointed about July or August, and of course had only the materials left by the previous Medical Officer of Health for the first half of the year with which to deal, is found on page 49: "No deaths occurred from this disease in the year now under review. Eight cases only came to the knowledge of the health authorities, and these all recovered under treatment at hospital. The average annual number of deaths for the past 10 years has been 1·7." There is a reference also in this 1885 report, at page 34, to vaccination, which I had better read. He says: "The returns of vaccination, as supplied to me by the kindness of the clerk to the Guardians, show that during the past year only 1,842 children have been successfully vaccinated, so that, after all allowance has been made for deaths and removals, there must remain at the lowest estimate some 2,000 children born during the year who have received none of the protection against small-pox which this operation secures. In 1884 there were 4,147 children not vaccinated (including deaths and removals, &c.); in 1883 the number was 3,079; and in 1882 it reached 2,187."

16,380. Then he goes on to recite the facts as to the want of vaccination, which we know?—But I would ask

leave to read the succeeding paragraph: "Since 1880 the number of unvaccinated children has rapidly increased, and at the present time the vaccination laws are in Leicester practically in abeyance. To all those personally familiar with the ravages that small-pox makes, when it unfortunately attacks an unprotected individual, this accumulation of inflammable material, at the rate of more than 2,000 a year, appears a matter of a most alarming character; and though happily hitherto, by prompt and energetic measures, this loathsome and dangerous disease has been successfully dealt with, it is to be feared that when this unprotected population shall have grown up and increased in numbers a terrible Nemesis will overtake it in the shape of a disastrous epidemic. Seeing that the objection to the operation is so widespread in the town, it becomes a matter for the serious consideration of those charged with the carrying out of the law whether it would not be a wise procedure to encourage and provide facilities for the use of animal lymph, instead of that derived from the human subject, and thus try to meet some of the objections of the opponents of vaccination."

16,381. Is that all in that year's report which it is necessary to read?—Yes.

16,382. Then you pass now to the report of 1886?—Yes, to the report of 1886. In this report there is a reference to vaccination at page 47, which I should like to read. After referring to the number of vaccinated as being considerably less than 25 per cent. of the children born, the Medical Officer goes on to observe: "The opposition to this operation is in Leicester more firmly established than ever. At the last election of the Guardians (upon whom devolves the duty of seeing the law relating thereto carried out) this question of vaccination or no vaccination was made the principal one upon which the election was decided—"

16,383. Is it necessary to read this paragraph? Does it do anything more than recite the evidence that we have already had before us?—It is important, in view of what follows at the latter end of the paragraph: "with the result that a majority was returned pledged not to enforce the same, and the vaccination laws are to-day in Leicester absolutely in abeyance. No prosecutions are instituted against defaulters, and no one who cares to neglect this precautionary measure in relation to his children's safety has any pressure brought to bear upon him in the matter." I do not see how the Medical Officer can correctly make that observation because all the legal notices threatening prosecution before the magistrates are issued just the same as ever. "The sad feature about the whole business is that it is the young children of the town who are growing up in thousands unprotected and are running a risk to their lives; they have but to come in contact with the first breath of infection of small-pox to at once contract this loathsome disorder. And seeing that as yet small-pox is always present in some parts of the country, with our modern improved means of rapid communication, they can hardly expect to pass through life (at least many of them) without at sometime or other being brought into dangerous proximity to its contagion. When a person has arrived at years of discretion there is more justification for neglecting the repetition of the operation if he be so minded." Speaking of small-pox at page 10 of the same report he says, "The one case met with was in the person of an artisan, who came into the town seeking work, and who evidently had brought the disease either from Sheffield or Nottingham, he having been in those towns some 12 or 14 days before. The usual prompt measures were adopted, the patient was removed to the small-pox wards, and two other persons who had been in contact with him were subjected to 14 days' quarantine and were re-vaccinated, both of whom escaped the disease; the room he had occupied was thoroughly disinfected, and the bedding he had slept on destroyed. No other case occurred." These are the two cases I referred to just now, and these being tramps who were "re-vaccinated" it follows therefore that they were both vaccinated. In a further paragraph the Medical Officer says: "It may be interesting to observe that during the year one of the leading medical journals sent down a special commissioner to investigate the system adopted in Leicester, whereby it was able year after year to keep free from small-pox. In this report (see "Lancet," June 5, 1886) full justice is done to the thoroughness and promptitude with which the



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"disease is grappled, though in common with all who have had much experience in dealing with it in epidemic form it sounds a note of warning as to what may be in the future for a town the bulk of whose population is growing up practically unvaccinated."

16,384. Whence do you derive the figures which you have given relating to the year 1885 in the first column of your table given on Diagram D., namely, that there were four importations during that year, and in the sixth column that the source of them was Sheffield, London, and some place unrecorded?—The report for 1885 reads thus in respect to small-pox at page 12: "During the year small-pox has made its appearance at four points in the town, three of the cases were found to be undoubted importations, one being from Sheffield, and the other two from London. As to the fourth case, nothing definite could be ascertained; the patient had attended the races some fourteen days before he fell ill, and as there were no cases of small-pox in the town, it is supposed he came in contact with some infected person on the course. A doubtful case was reported in St. Saviour's district; the man, as a precautionary measure, was removed into quarantine, and the disease not having developed was discharged at the end of a period of 14 days. By the prompt and vigilant action of Inspectors Braley and Buxton all these cases were at once removed to hospital, and those persons who were known to have possibly been infected by them were removed to the quarantine wards; four of these fell ill with the disease whilst there, and the others were discharged at the end of the usual period of incubation, no symptoms of small-pox having developed." I should like to say further, in regard to that fourth case where the infection was supposed to have been taken on the racecourse, that I have made a particular personal inquiry of Dr. Tomkins respecting that case. He accounts for it as an importation by saying, that some one must have been suffering from the disease upon the racecourse, and that the man took his infection there. He gave me this as his own personal opinion from private information, and if he comes before the Commission he will doubtless verify it. At any rate he gave me the information so emphatically that I felt justified in entering it upon my table.

16,385. You were going to refer just now to the report made by the special commissioner sent down by the "Lancet"?—Yes; in 1886 the "Lancet" sent down a special commissioner to inquire into the methods of dealing with small-pox in Leicester. No one seems to know why he was sent—whether he came by invitation or spontaneously from and on behalf of the "Lancet."

16,386. Is his name given?—His name is not given. I have made personal inquiries about him, besides having looked through the report which was published in the "Lancet," of June the 5th, 1886. At pages 1090-91 the report is as follows: "The public hears so much about the neglect of vaccination in Leicester and the absence of small-pox that in a less enlightened age we might be in danger of a reversal of public intelligence on the subject. The protection of the community from a plague so deadly and so disgusting may well excite admiration, whatever arrangements conduce to so great an end. It is of great moment, therefore, to ascertain what the arrangements are. Jenner is a great name in medicine, and is not likely to lose its fame. And small-pox when it occurs can be as fatal at Leicester as anywhere else."

16,387. Is it necessary for us to hear the observations of this unknown gentleman; they will not carry much weight, I should think, with the Commission?—He deals with such an important matter touching the administration of Leicester—

16,388. Whenever you come to the administration of Leicester that will be the part to read?—There are only a very few of these general observations.

16,389. Then will you continue reading?—"It is sometimes hæmorrhagic, sometimes confluent. In 1887, of 12 cases, five died. Isolation and disinfection promptly and thoroughly carried out are the vaunted measures in Leicester; and to read the newspapers, or even the sanitary reports, one would almost think they were all sufficient. For 10 years they have not had a great epidemic. Much inflammable material is being prepared. But does not Leicester by sanitation and isolation almost nullify the fact and justify its authorities in their disrespect-

ful and even hostile attitude to vaccination? The methods of Leicester are thus summarised in the annual report for 1884 of the sanitary condition of the borough by the late able Medical Officer of Health, Dr. William Johnston." He then refers to an extract from the report for the year 1884, which I do not think I need read again. Then further on he says: "I make this quotation because it is the statement of the case of the Leicester authorities in a nutshell, and by no unfriendly hand, and by a medical man, let me add, who knows well the importance of vaccination. Here, then, seemed a case calling for investigation and some revision of our severe condemnation of those Guardians and Town Councillors who are unfaithful to their duties as vaccination authorities. The threat of a future retribution, however well founded, has little effect on those who enjoy present immunity and think they have discovered a method of proceeding which supersedes vaccination. In my endeavours to ascertain the real secrets of an immunity which seemed capable of a very different explanation from that given by the anti-vaccination authorities, I have to acknowledge the courtesy of the municipal authorities and the perfection of the sanitary arrangements. I must, too, in passing pay a tribute to the architect of the municipal buildings, as well as to the community, whose conception of municipal functions was so high as to raise such structures for their public offices. I must especially thank Mr. Windley, chairman of the sanitary committee, and the Medical Officers of Health, the late and the present, Dr. Johnston and Dr. Tomkins, for an explanation of the system which is followed when a case of small-pox occurs, which is very briefly told. The radical community of Leicester has no compunctions in restricting personal liberty except in the matter of vaccination. They have a law of compulsory notification of infectious diseases requiring a medical man to report the case as soon as he is aware of it. It is alleged that this law works so well that all the objections of medical men to it have ceased. No sooner is there a case of small-pox reported than the Medical Officer of Health is down upon it with his staff of inspectors. Unless the house is very favourable for isolation the patient's removal to the infectious hospital is urged, and is promptly executed. Not only so, the removal of all the other inmates of the house is strongly pressed. Actual legal powers do not exist. But without these pressure can be applied. If a workman has to be influenced and is rather rebellious he is told that his employers shall be informed of the facts of his obstinacy. He is offered compensation for loss of time and loss of property. So with all other inmates. And up to this time all resistance has been overcome, and for 10 years Leicester has not had a bad epidemic, and its authorities boast of their promptness and success in carrying out isolation. Disinfection, too, is energetically applied to premises and property. I acknowledge that they do this part of their duty well and successfully. Equal success has been attained in other places, notably South Shields, where Dr. Munro reports that in three years and a half small-pox has been introduced 33 times, and each first case has been removed to hospital, with the result that in no single instance has there been any extension of the disease after it has been reported to the Health Office. In Leicester there have been occasionally two or three cases among those removed to quarantine. But the success of the system has been great, and undoubtedly goes far to show the desirableness of a general compulsory notification system. But now I come to another little factor in the protection of Leicester from small-pox, which will surprise plain people out of the profession, and I am persuaded not a few of the good people of Leicester themselves, when they have their minds directed to it. 'Tell it not in Gath,' but it is even so. Leicester owes its protection, even with all its boasted and really good sanitary arrangements, to vaccination, or rather, I should say, to re-vaccination. All the persons in the house of the patient are vaccinated or re-vaccinated. Every person brought into contact officially with the case of small-pox—the Medical Officer of Health, the inspectors, the nurses and matron of the infectious hospital—are all vaccinated and re-vaccinated. And I am bold to say that without this protection of vaccination the perfect sanitary arrangements of Leicester would break down in a month. For it is not only that people who are re-vaccinated never take the dis-



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" ease, but that people who are not re-vaccinated, who are brought into close quarters with it, do generally take it. Certainly we ought to hear no more of Leicester's independence of vaccination. If her sanitary authorities really believe in their sanitary and disinfecting appliances *per se*, let them put our statements to the test, let them remove the cordon of protected persons about the cases, and their boasted arrangements will prove a delusion; the sick will be without nurses, and the very industry of Leicester will be molested by a plague which will stagger the radical authorities of the borough and bring the thousands of unvaccinated and unre-vaccinated inhabitants to cry for the blessings discovered by Jenner. I need not say that Dr. Johnston and Dr. Tomkins entirely agree with me in this estimate of the part played by vaccination in Leicester. Like most Officers of Health they attach great importance to the compulsory notification of diseases; and Dr. Johnston at least is of opinion that with a universal system of this kind and an efficient and energetic staff for carrying it

" out, the severity of the vaccination laws might at least be relaxed. Dr. Tomkins lately expressed his views of the urgent need for such a system in the metropolis, in the 'Lancet' of May 2nd, and few could speak with more authority. But it is superfluous to say that they believe in vaccination, and that but for their use of it the authorities of Leicester would be mocked in their boast of mere sanitary precautions. Dr. Tomkins, indeed, is the author of one of the most powerful arguments for compulsory vaccination in the language, read before the Society for the Abolition of Compulsory Vaccination, London."

16,390. (Mr. Dugdale.) I see they say unless the situation of the house is very favourable to isolation. Are there any cases in Leicester in which the people have been isolated without being taken to the hospital? --Not that I am aware of, of course the writer is giving us such information as he could gather, besides placing upon it his own biased constructions. Many of his statements are misleading, and some of them are absolutely untrue.

Adjourned till Wednesday next at 1 o'clock.

## Sixty-eighth Day.

Wednesday, 10th June 1891.

### PRESENT:

SIR JAMES PAGET, BART., IN THE CHAIR.

Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORDTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. WILLIAM JOB COLLINS.  
Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.

Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

16,391. (Chairman.) Will you continue the statement which you were engaged in making last week?—I was requested last week to furnish a distribution of the small-pox cases that were referred to in the table given on Diagram D., and perhaps I had better refer to that now. I have been carefully through the Medical Officer of Health's reports. The distribution of the small-pox cases referred to in Diagram D. is as follows:—(a) Those within the borough; (b) those in adjacent districts, which practically form part of the borough; (c) those which have been received into the Fever Hospital from parishes several miles distant from Leicester; and, lastly, (d) those of tramps. The 116 cases are thus divided: 86 of them were inhabitants of the borough, 5 of them were from parishes which immediately adjoin and are contiguous to the borough, 6 of them were from country districts several miles outside of Leicester, and 19 of them were tramps, making the total of 116. It will be seen from this statement, which I was last week requested to prepare for the Commission, that the great bulk of the risks were those of borough cases. Eighty-six were inhabitants of the borough, and 19 were tramps who came into the town, practically making 105 borough cases out of the total of 116. I should like also to state in this connexion that in the year 1882 the Medical Officer of Health at page 23 of his report refers to 29 small-pox cases, he afterwards enters the number as 30 in the table in his report, but in the list of cases at the Fever Hospital given at the end of his report there are only 28 names. In respect to the year 1885 there is no specific or detailed information given in the report as to where the cases came from. In the year 1888 there is also a little discrepancy in the Medical Officer's report, and there is some uncertainty

as to whether the actual number of small-pox patients, at the Fever Hospital, was 22 or 23, but in this table I have taken the lowest number, because we were unable to clear up the point.

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16,392. What do you next wish to state?—The subject I wish to refer to next is one that we were dealing with at the close of the last sitting, with regard to untrue and misleading statements which have been made in respect of the treatment of persons upon the outbreak of small-pox in Leicester. Such unfounded statements have been made in that article which I read from the "Lancet."

16,393. By whom is the statement made?—By the special commissioner of the Lancet.

16,394. Is that in the nature of evidence for us?—I think it is, in regard to the subject we are dealing with at the present time, namely the voluntary character of our system of quarantine, and that the vaccination of quarantined persons is not compulsory, but entirely optional on their part.

16,395. Does it supply the Commission with any facts upon the subject?—The refutation of the false statements made will do so. I wish to bring before the attention of the Commission the number of persons who were placed in quarantine and who were not subjected to the operation of vaccination, and for that purpose I have prepared a table, which I now hand in. (The table was handed in. See Appendix III., Table 9. page 435.) This table shows for the borough of Leicester the number of persons vaccinated or re-vaccinated after voluntarily entering the quarantine wards. It is compiled from information supplied by the Medical Officer of Health for the years 1886, 1887, and 1888,



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no definite official information existing for the years previous to 1886. In the year 1886 there were two persons, tramps, quarantined, both of those were re-vaccinated after entering the quarantine wards.

16,396. (*Sir William Savory.*) Do you mean by the terms "vaccinated" and "re-vaccinated" the performance of the operation or its successful result?—In regard to the two I have just mentioned the Medical Officer in a letter sent to me refers to them as being successful vaccinations.

16,397. Are we to take it that it means successful all the way through?—It is not for me to define what is, or is not, a successful vaccination; but in the ordinary usage of the term I think you might take it so.

16,398. Are you sure of that?—The information supplied to me is from our Medical Officer, and as he is considered to be a great authority on the subject, I presume he would not enter them so unless he regarded them as successful operations, whatever that may mean.

16,399. The question is, does it mean merely the performance of the operation or that the operation was successfully performed?—I should think that all operations, when performed, must be successful as operations; what the results may be is a totally different question. Dr. Tomkins only qualifies it with regard to these two by saying that it is successful. As regards all the others he merely mentions that they were vaccinated or re-vaccinated.

16,400. Then we must take it as doubtful as to the result?—If the results of such operations are generally doubtful it might be taken as doubtful.

16,401. (*Sir Charles Dalrymple.*) The mention of "successful vaccination" in those two cases would rather lead one to infer that the others were only operations?—I think that would be rather too sweeping an inference to draw.

16,401a. (*Sir Charles Dalrymple.*) It is sweeping and perhaps too sweeping, but we are quite in a condition of uncertainty as to what the result was?—If the unqualified word "vaccinated" conveys no definite idea to the professional mind; a layman may be excused if he finds it difficult to define it.

16,402. (*Mr. Picton.*) Do you mean to say that you draw a distinction between those cases and others, or that in those cases he said they were successful and was silent about the others?—It is the Medical Officer who makes the distinction. In this case he puts "successful" in brackets; in the other cases he only says they were "vaccinated," and I fail to see how he could describe them as "vaccinated" unless he believed the operations had been successfully performed; especially as some of these operations are described as "unsuccessful," or "abortive." Now resuming my statement, out of 14 persons placed in quarantine in 1887 there were four vaccinated after being placed in the quarantine wards, one re-vaccinated, and nine upon whom no operation was performed; of those nine, two were vaccinated two days before entering quarantine.

16,403. (*Chairman.*) I notice you have written down here "before entering the quarantine wards"?—Yes, "before entering the quarantine wards." In 1888 no fewer than 39 persons were placed in quarantine, two of these were vaccinated after entering the quarantine wards; and three were re-vaccinated; 30 were neither vaccinated nor re-vaccinated whilst in quarantine; and four of those placed in quarantine in that year were unvaccinated and remained unvaccinated. One of the 30 was vaccinated the day before entering the quarantine wards.

16,404. (*Mr. Meadows White.*) That would mean that those remained unvaccinated?—Yes. The four were unvaccinated and remained unvaccinated. Therefore it will be seen that of the 55 persons quarantined in 1886-88, only 12 were vaccinated or re-vaccinated whilst in quarantine; and if to these 12 we add the three who underwent the operation immediately before entering, there remains 40 persons out of the 55, or 72·7 per cent., who were neither vaccinated or re-vaccinated during the quarantine period.

16,405. (*Professor Michael Foster.*) Do you know what is the Medical Officer's criterion of vaccination; merely the report that they had been vaccinated or the vaccination marks?—I am unable to say what test he applied, but I think in most instances he would carry out a personal examination and also ask for information.

16,406. Combining the two?—I cannot say certainly; but I should think so.

16,407. There are two definite columns here; "vaccinated" and "re-vaccinated"; how does the Medical Officer assure himself that the one was a real re-vaccination and that the other was a real primary vaccination?—There is no doubt that he would accept the statement of the persons themselves, but I should think he would also supplement that by a personal examination to satisfy himself before he made the entries.

16,408. (*Sir William Savory.*) What is the object of this table, what is it to show?—It is to show the untruthful nature of the statement, so frequently made, that all persons entering our quarantine wards are compelled to be vaccinated. It has again and again been stated that in Leicester we are utterly regardless of personal liberty excepting so far as it concerns vaccination. Then by a strange contradiction it is stated that people are very often taken into quarantine against their will, vaccinated against their will, and that the whole thing is carried out in a very arbitrary manner. The table shows that there is no foundation whatever for such statements. If the statement of the special commissioner of the "Lancet" had simply rested where he left it, it might not have been necessary to refer to it at all, but the statement has been referred to in Parliament by Mr. Ritchie, in debate, and has been spread broadcast all over the country, and I wish to show that it is entirely unfounded and untrue.

16,409. But these tables show nothing about voluntary or involuntary vaccination; how do they throw any light upon the question whether or not these people were taken into quarantine against their will, and vaccinated against their will?—Yes, Table 9 does throw a light upon this part of the subject because it proves that the greater part of them were not vaccinated or re-vaccinated when in quarantine. In fact it shows that 43 out of the total number of 55 did not undergo the operation.

16,410. But still that has a very indirect bearing upon the question you just raised that certain persons were taken into quarantine against their will, and vaccinated against their will; this table seems to meet that statement in a very indirect way, it shows that only a small number of the persons in quarantine were vaccinated whilst in the wards, but those persons might have been vaccinated for anything the table shows against their will, although it no doubt was not so?—The table shows that only a very small number of those placed in quarantine were subjected to the operation; and I could not possibly have shown so great an exemption from the operation had it been enforced as alleged.

16,411. But still for anything this table shows those persons who were vaccinated might have been compulsorily vaccinated, while the others successfully resisted it?—I cannot understand a compulsion which could be so generally and successfully resisted as my figures would show. There is nothing upon the face of the table either way as to such a contest being carried on in the quarantine wards.

16,412. (*Mr. Picton.*) Is not your object to show that there is no such compulsion existing in the quarantine wards?—There is none at all. No compulsion whatever has been exercised in respect to quarantine.

16,413. If only two were successfully vaccinated, it would follow that all the rest were left unvaccinated?—Yes, that would logically follow, but I do not know that we should be justified in making such an inference practically.

16,414. (*Dr. Collins.*) Am I correct in concluding that, at any rate, part of the object of putting in the table was to meet the statement that every person brought into contact with a case of small-pox is vaccinated or re-vaccinated?—Yes, as I have said before, it was to meet that statement.

16,415. That statement is made, as I understand, by the special commissioner of the "Lancet"?—Yes, it is made by the special commissioner of the "Lancet," and has been reiterated by many others.

16,416. (*Chairman.*) How does it bear upon the questions before the Commission to show that any journal has been in error?—We are speaking now of the manner in which Leicester deals with small-pox.

16,417. I want you to make a statement as to the way in which it does so; not to make any statement as to the



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way in which it does not deal with it?—But it has been asserted again and again in the House of Commons and elsewhere that we at Leicester after all rely upon vaccination; that it is our first line of defence, and I am proving that it is not so.

16,418. Your facts would prove that you do not; if you have any erroneous statements we need not have them before us?—I have handed in this table as a record of facts.

(*Chairman.*) But we do not want to know anything which has been said, as you suppose, erroneously by others; if you give us the facts that is all we need.

16,419. (*Mr. Picton.*) You attach great importance, I believe, to the statement of Mr. Ritchie in the House of Commons?—I attach very great importance to the statement, because that statement is quoted all over the country.

16,420. Is that statement before the Commission?—I could refer you to it. It was reported in the "Times" of July 23, 1887.

16,420a. (*Mr. Meadows White.*) The fact seems to be shown by the table that there were four people in quarantine unvaccinated?—Yes, and this fact shows that even unvaccinated persons were not compelled to be vaccinated in quarantine.

16,420b. (*Sir William Savory.*) Out of 55, and that seems to show that 51 out of 55 had been vaccinated?—Yes, vaccinated at some time or other, but not necessarily during quarantine. But the great majority of them were placed in quarantine, because it was felt that no reliance could be placed upon their primary vaccination.

16,421. That is quite another question?—It may be so, but I think it has a very important bearing upon the question from the fact that we have a total of 43 out of 55 who were not at all subjected to the operation while in quarantine.

16,422. But of the 55 persons there were only 4 who had not been subjected to some process of vaccination?—That is so, at some time or other of their life, but that has no bearing whatever on the question now before us.

16,423. (*Dr. Collins.*) 43 out of 55 were neither vaccinated nor re-vaccinated while in quarantine?—That is the point; they were not vaccinated while in quarantine.

16,424. (*Professor Michael Foster.*) This information is supplied to you privately, I believe; it is not published anywhere?—It is not published anywhere except in reference to the two cases for 1886, which are mentioned in the report, and these are the two cases which have given rise to the absurd statements to which I am referring.

16,425. The rest has been communicated to you privately by the Medical Officer of Health?—That is so. The statement made by Mr. Ritchie was reported in the "Times" of July the 23rd, 1887. In the debate in the House of Commons upon this question he said as to Leicester, "Whenever there was the least suspicion that anyone was suffering [from small-pox] not only the patient, but everyone in the house was removed. What do they do then? Why they immediately proceeded to be vaccinated. Everyone in the house."

16,426. (*Chairman.*) That you say is erroneous?—Yes; I say that is entirely erroneous and misleading. Mr. Picton contradicted the statement at once in the House of Commons, and said, "They clean up the house, sanitise it, and put it in proper order." Mr. Ritchie replied, "No doubt they cleaned up the house, but all in the house were vaccinated and re-vaccinated, that was his information." I presume in addition to the information supplied by the special commissioner of the "Lancet," Mr. Ritchie would no doubt have what he considered to be reliable information from some other quarter; but, whatever the source of his information, the statement I know is entirely erroneous.

16,427. (*Sir William Savory.*) You do not show that?—I affirm it, and this table proves it. This table shows that all in the house where the outbreak occurred were neither vaccinated nor re-vaccinated after their removal to the quarantine wards of the hospital.

16,428. Where is the contradiction of that? I am not saying whether it is correct or incorrect, but where is the contradiction of that?—The contradiction is contained in the facts found in the table I have put in.

16,429. That refers to the quarantine, but the "persons in the house" are not in quarantine?—I have made the statement that they are taken to quarantine.

16,430. Is the word "house" synonymous with "quarantine," that is to say, with the hospital where they go? When you say the "house," does not that mean the house in which the outbreak took place from which the people were removed?—Yes, that is my meaning.

16,431. But when you speak of persons placed in quarantine it does not refer to them, does it?—Yes. The persons in quarantine would be persons removed from the house where the outbreak took place.

16,432. But the "persons in the house" may have been vaccinated who were not removed to quarantine or they may have been vaccinated before they were taken to quarantine?—I have given in this table the particulars of those who were vaccinated before they were taken into quarantine, and also of those who were vaccinated afterwards; and, so far as I know, no information exists as to whether or when any other vaccinations took place.

16,433. (*Mr. Dugdale.*) This table shows only six re-vaccinations; what you object to is the statement that they were all re-vaccinated after being taken into quarantine?—Yes, I object to the statement by Mr. Ritchie that any or all were vaccinated or re-vaccinated under compulsion either in the home or while in quarantine.

16,434. (*Dr. Collins.*) I suppose if there were other people living in the house besides those who were taken into quarantine it would be reasonable to suppose that those who were taken into quarantine would be those who would be most likely to have been exposed to the infection rather than the others?—Yes, that should follow as a matter of course.

16,435. (*Sir William Savory.*) But what about the others? Are the others in the house not vaccinated who are not taken into quarantine?—No, decidedly not.

16,436. (*Mr. Dugdale.*) I thought that the Leicester system was to take everybody in the house into quarantine?—That is a prevalent mistake. The authorities do the best they can to persuade them, but they do not always go. There have been some 15 or 20 persons who have refused to go into quarantine altogether, but others have generally consented and have gone entirely of their own free will.

16,437. (*Professor Michael Foster.*) 15 or 20 cases?—Yes, 15 to 20 instances, where they have refused to go into quarantine.

16,438. (*Sir Guyer Hunter.*) But how do you exercise any discretion as between those who are left behind and those who are not left behind?—There is no discretion beyond this, that those who have been in closest contact with the disease are selected for quarantine, if they will yield to persuasion. All are advised, but none are compelled. Some would not be persuaded and they refused to go.

16,439. (*Mr. Bright.*) Your statement is that there is no force used to drive people into quarantine, and that there is no force used to compel people who are opposed to it to undergo vaccination?—None at all. No compulsion is used for either purpose.

16,440. Then that is a direct reply to the statement made by Mr. Ritchie in the House of Commons to which you object?—Yes, and to statements to the same effect which have appeared all over the country.

16,441. (*Professor Michael Foster.*) Do you say that the statement about the successful vaccination of the two tramps in 1886 was in the local Medical Officer's report?—Yes, on page 10. There is a paragraph on page 10 relating to small-pox in which he says: "The usual prompt measures were adopted; the patient was removed to the small-pox wards, and two other persons who had been in contact with him were subjected to 14 day's quarantine, and were re-vaccinated, both of whom escaped the disease; the room he had occupied was thoroughly disinfected, and the bedding he had slept on destroyed. No other case occurred." These two persons were the two tramps who were removed from the Workhouse; in fact all three cases were removed from the Workhouse.

16,442. I do not see the word "successful" here?—That is on a private note which the Medical Officer sent to me. The point of this particular part of the inquiry is not so much as to the effect of vaccination in preventing small-pox as to the method of dealing with



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it which is adopted at Leicester. I think it is necessary to show that we pay quite as much regard there to the liberty of the subject as they do elsewhere, and probably more. The total number of persons who have been placed in quarantine since this method was introduced in 1877 is 183, and of this number 133 were neither vaccinated nor re-vaccinated either immediately before entering or whilst in the hospital. I think that this fact thoroughly disposes of the statement which has been made in regard to the compulsory vaccination and re-vaccination of all persons taken into our quarantine wards.

16,443. That statement is based upon private information from the Medical Officer?—Yes, upon private information from the Medical Officer and from the sanitary inspector.

16,444. (*Mr. Dugdale.*) Could you tell us how many of the 183 took the small-pox while they were in quarantine?—I could not tell exactly, but I should say about a dozen developed the disease after being in quarantine. Writing upon this question, our Medical Officer, who was appointed in 1885, in a letter he addressed to Dr. Barlow, of Manchester, in 1886, says, "Our staff at the small-pox hospital are vaccinated and re-vaccinated with the exception of the matron, who has not been re-vaccinated. Our sanitary staff and myself, I need hardly say, are also re-vaccinated; as to the persons who may have been exposed to infection in a house where a case of small-pox occurs, we get as many as possible into quarantine wards and re-vaccination is offered to them, though of course there is no power to compel this operation against their will, though practically I have found but little trouble so far in obtaining consent." At the time this letter was written Dr. Tomkins had been in office about a year; he had only had experience of one case of small-pox, and the only operations he had carried out were those two of the tramps to which I have already alluded.

16,445. (*Professor Michael Foster.*) Do you mean to say that those remarks of Dr. Tomkins refer entirely to those two tramps?—Yes, they are based upon those two cases alone.

16,446. He uses the phrase "most of them," does he not?—He uses this phrase, "though practically I have found but little trouble so far in obtaining consent"; of course these words might be supposed to convey the idea that he had had a very large and long experience at Leicester, but this letter was written in 1886 and he was only appointed in 1885. In further proof of the point which has just been raised I may mention that in a letter of the chairman of the sanitary committee, addressed to the "Times" of October 12th, referring to this question, he says: "The present Officer of Health has only had experience of one case of small-pox here, and in that instance the two old people who accompanied the patient from the Union Workhouse where the case was found were re-vaccinated, of course with their consent." I should now like to complete the quotations from the Medical Officer's reports. At page 13 of the report for 1887 the Medical Officer, referring to small-pox, says: "The most noteworthy fact in connexion with infectious disease, during the year under review, was a slight outbreak of small-pox, occurring in November last, which has attained much notoriety throughout the country, and concerning which much exaggeration and mis-statements have been indulged in by misinformed writers in the public press, and others. The facts shortly stated are as follows: About the middle of November a boy residing in Gresham Street was attacked with a mild eruptive fever, which was thought by the medical man in attendance to be chicken-pox; four other children in the house subsequently contracted it from him, the youngest of these being a child four years of age, unvaccinated, and in whom the disease, instead of running a mild, abortive course, developed in the usual manner seen in an unvaccinated person. The disease was then recognised as small-pox, and the whole of the patients were at once removed to hospital, whilst the father and mother and three other children were removed into the quarantine wards, where two of the latter, within a few days, developed the disease, and passed through a most trivial attack, they being both well protected by efficient vaccination in infancy. From these cases one other arose, on the other side of the town, in the person of a young man who had visited the former family. This patient had been vaccinated

"in infancy, and the attack was also of a trifling description. After diligent search and inquiry the source of infection of this outbreak could not be satisfactorily ascertained; the father had been working in Warwickshire, coming home periodically to his family, and it is possible he may have unknowingly brought the infection, without himself suffering from the disease." Later on there was another case, on the 14th December, in Brandon Street. The report says: "The same measures were adopted; prompt removal of the patient to hospital, of his family to quarantine, and thorough and efficient disinfection of all infected things and rooms; and no extension of the disease from this case occurred. This man was unvaccinated, and suffered most severely, barely escaping with his life." In connexion with the above statement of the Medical Officer of Health I wish to refer to another statement which has been made to me privately by him, and one which no doubt he would repeat before the Commission. It is to this effect, that he was sure he would be able, if he passed through a hospital, to select, without examination of the arm, and without any information, those patients who had been vaccinated and those who were unvaccinated.

16,447. (*Chairman.*) Do you mean amongst patients suffering from the small-pox?—Yes, patients suffering from small-pox. He says that the type suffered by the vaccinated is so different in its main features from that of the unvaccinated. As regards the man who he states barely escaped with his life, and whom he describes as unvaccinated, I have information from another source telling me that this very same man had been in the army and that he was vaccinated. In fact I saw the man myself and he wrote a statement to that effect. He states also that he informed the Medical Officer that he had been vaccinated while in the army, yet he is reported here as unvaccinated.

16,448. (*Mr. Dugdale.*) Then, I suppose, it could not have been an effective vaccination while he was in the army?—In his letter the man says he was successfully vaccinated. I have a copy of it here which I can read if the Commission so desire. But turning to the Medical Officer of Health's report for 1887 there is another paragraph which I think should be read: "Since the commencement of the present year (1888) eight other cases have been met with in the town; three children in one family unvaccinated, and one man unvaccinated, have suffered severely; the other four vaccinated patients have had but very mild attacks. To those who have carefully watched these sporadic cases, cropping up in various parts of the town, and the means adopted to arrest their spread, it is self-evident that prompt notification, and removal of the patients and infected persons from the midst of the community, have been our mainstay against the extension of this most infectious disorder; and no small credit is due to the inspectors, and especially to Inspector Braley, for his energy and aptitude in following up and discovering every person known to have been exposed to the infection of any of the above cases, and for the vigilant watch kept over those who were suspectedly infected. Had any such efficient system been in force at Sheffield it need not have been to-day suffering from a widespread epidemic, which has got beyond all control."

16,449. (*Chairman.*) Surely we need not have that opinion read over to us of what might have been done at Sheffield; do let us have the facts?—I venture to think that this concluding paragraph is most important, because, if in the belief of such a Medical Officer as ours, who is a great believer in vaccination and has been described as the "author of one of the most powerful arguments for compulsory vaccination in the language," the method in vogue at Leicester would have been efficient in staying the outbreak at Sheffield, it is surely most important to have his statement recorded here.

16,450. (*Sir Charles Dalrymple.*) I do not see how one is to draw any tribute to isolation from the first case; did you not say that a family and a young man, a visitor, who had had the disease very slightly, were isolated and that they had previously been vaccinated?—There were four children in the house who had previously been vaccinated.

16,451. And a young man, a visitor, who had previously been vaccinated?—Yes.

16,452. They were afterwards isolated and had the disease slightly?—Yes.



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16,453. How do those circumstances specially tell in favour of the system of isolation?—Because by their removal we prevented the spread of the disease in the town, which is the main point in the question.

16,454. There is another point—that they had been vaccinated—I do not say that it is due to vaccination that they had the disease slightly, but it would be equally fair to suggest that, would it not?—Do you mean it would be owing to vaccination that they had the disease slightly.

16,455. Yes, you suggested that it was owing to the isolation that they had the disease slightly?—No; I did not suggest that. What I said was that isolation had prevented the spread of the disease.

16,456. Then I do not follow your point?—In this particular case the man taken from Gresham Street with his wife and children were believers in vaccination, and they and all the children had been vaccinated except the youngest, which, on medical advice, was left unvaccinated, but five of the vaccinated family took small-pox before the unvaccinated infant caught the disease, and comments appeared in the local press, and elsewhere, remarking on the fact that the vaccinated members of the family were the first to fall a prey to the disease. In the report for 1888, at page 12, the Medical Officer refers to 21 cases of small-pox that had been met with in the town, and he deals with them seriatim, but there are one or two cases he deals with there that I should like to refer to specifically, because I know the family. One of them is Case II., described as occurring on January 6th. “C. L., female, age 6 years; Bond Street; some doubt as to source of infection. Smart attack, eruption semi-confluent. Good recovery, without any serious complication. Patient unvaccinated.” Then, taking Case V., this was a sister of Case II., he states that it occurred on January 17. “L. L., female, aged 5 years; Bond Street; infected by Case II., severe attack, eruption semi-confluent, followed by inflammation of one eye and disfigurement of skin; unvaccinated.” I know this family, and have seen this child repeatedly since it came out of the hospital, and I must say that I cannot observe any disfigurement of the skin, in fact a few feet from the child you really cannot tell that it has suffered from the disease at all. Then another sister of the same child is Case VI. “January 17th, C.M.L., female, aged 3 years; Bond Street. Infected from Case II. Very severe attack. Eruption confluent. Much suppuration and destruction of skin, and inflammation of eyes with ulceration of cornea. Skin disfigured; unvaccinated.” From reading these statements it would naturally be concluded that the eyes were injured as the result of the attack of small-pox, but I am informed by the father of the child, and also by a Leicester medical man who was in attendance, that this child suffered from inflammation of the eyes and ulceration of the cornea before she had small-pox, and that in this respect she has since been neither better nor worse.

16,457. (Chairman.) Is this report by the same Medical Officer?—Yes, by the same Medical Officer who was appointed in 1885; he has remained in office up to the present time.

16,458. You quoted him just now, I think, as a very accurate person, did you not; you relied very much upon his previous reports?—I do not know that I quoted him as being so very accurate.

16,459. Did you not last time in reference to his statement about the isolation?—No; that was the previous Medical Officer, Dr. Johnston.

16,460. And this is not the same Medical Officer?—No; his successor.

16,461. (Dr. Collins.) Are those three cases of which you have just read the particulars the only ones stated to be unvaccinated out of the 21 dealt with in that year?—Yes, they are, if we except Case IV. as being doubtful.

16,462. (Mr. Meadows White.) Is it stated in the report whether the others were vaccinated or not?—Yes; all the others who took small-pox were vaccinated; and in some instances the number of scars is given.

16,463. (Chairman.) I was struck with the contrast between your references to the previous statement by the Medical Officer and as to this about the damage stated in this case to have been done to children's eyes; it is

the same Medical Officer?—Yes; but what I wanted to point out more particularly was this, that, in dealing with the 21 cases seriatim, respecting those who were unvaccinated, the report seems to indicate that they suffered from very severe attacks, while with regard to the others they are said to have had only mild attacks. Now, knowing that particular family, I can only say that the observations made in this book respecting this family are inaccurate.

16,464. (Sir William Savory.) But you do not show that; there is the statement in this book of the Medical Officer who attended the child?—But I affirm it on my own personal knowledge, and the Medical Officer of Health is also medical attendant.

16,465. At the Fever Hospital?—Yes.

16,466. And he stated that there were ulcers upon the cornea?—Yes, and the inference is that it was due to small-pox.

16,467. You oppose to that the statement of the father who stated that there were ulcers previously to the small-pox, although he would not probably know whether they were ulcers or not; and then you quoted the statement of a nameless medical man?—It was the medical man who had previously attended the family. He renewed his statement to me last night.

16,468. Could you bring a certificate from him to show that there were ulcers upon the cornea before the small-pox?—Yes, I have no doubt I could obtain that if you wish.

16,468a. (Sir William Savory.) That would be evidence much stronger and more to the point than the evidence you give against it as the case at present stands; that medical man might possibly come before us and give that evidence, but at present he is a nameless medical man who told you?—I have not yet had authority to give his name, but I have already stated that he is the medical adviser of the family.

16,469. (Mr. Bright.) Did the Medical Officer who examined this child ever tell you that it had not previously had ulcers on the cornea?—No; he does not actually say that, but he speaks of it in such a connexion as to imply it. Any one reading this report for the first time would, I think, fairly come to the conclusion that this injury to the eyes was the result of the attack of small-pox.

16,470. The statement he makes is that these ulcers were the result of small-pox?—He does not actually say so, but he leaves the reader to infer that.

16,471. The father says that whatever these things were they were just as bad before as they are now?—Just the same, that the child had always suffered from them.

16,472. (Sir William Savory.) Only I submit that the father would not be a judge of that in comparison with a medical man?—The father would certainly know whether anything had been previously the matter with the child's eyes.

16,472a. (Mr. Dugdale.) The father ought to be asked a few questions about that by the Commission, because he may have made a mistake?—But the father's testimony is corroborated by that of a medical man.

16,473. (Sir William Savory.) Is that Case VI. a female aged three years?—Yes, Case VI. is the one I more particularly referred to.

16,474. It says, “Much suppuration and destruction of skin, and inflammation of eyes with ulceration of cornea”?—Yes, leaving it to be inferred that such was the result of the attack of small-pox.

16,475. He may be right or may be wrong, but what he intends to say here is doubtless that it was the result of small-pox?—He may have believed at the time that it was; he may not have known that the child had suffered from it before. I wish to put it as fairly as I can. This very question was raised at the sanitary committee after the publication of his report, and strong exception was then taken to the report by the medical man I have alluded to who is a member of the sanitary committee, because he knew to the contrary.

16,476. I was merely suggesting to you that if you wished to contradict a statement like that it would have been much more to the point to have brought a certificate from the other medical man to contradict the report of the Medical Officer?—That is so no doubt, and I will obtain one.



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16,477. (*Dr. Collins.*) I think that none of the 21 cases terminated fatally, whether vaccinated or unvaccinated?—None whatever, they all recovered, even the vaccinated. In 1889 we had no cases of small-pox, and special reference to that is made by the Medical Officer in his report. At page 91 he says, "Like ourselves," referring to a number of large towns, "several of these large towns and cities were entirely free from small-pox, no cases being met with in Derby, Huddersfield, Nottingham, Preston, Salford, and other places." The fact of all these towns being free from small-pox as well as Leicester, and Leicester, although unvaccinated being as free from it as they are, seems to me to be a good argument in favour of the system adopted in Leicester as against vaccination.

16,478. (*Chairman.*) Is the same system adopted in these other towns?—I think not entirely, possibly some part of it might be, as it certainly commends itself to the good sense of all sanitary authorities.

16,479. In what way does it affect the case of Leicester? You say it is an argument in favour of Leicester?—Yes, it is a powerful argument in favour of Leicester, because we have successfully stamped out small-pox without recourse to vaccination. In most towns already a similar method is adopted on an outbreak of small-pox; even at Sheffield they have been compelled to adopt our method to some extent, notwithstanding that they have been carrying out vaccination all along.

16,480. What other towns adopt isolation on the Leicester method?—I quoted South Shields, and I have observed that the same system is being recommended at Preston, Leeds, London, and many other places.

16,481. Do you know what is the general rule in large towns in England?—I do not know of any general or absolute rule, but sanitary authorities everywhere are beginning to rely less on vaccination and more on sanitation. I would like now to compare the cost of the system adopted in Leicester with the cost of vaccination, and for that purpose I propose to put in another table.

16,482. But going back to the previous question, have you looked through the cases of small-pox in other large towns in England with reference to their immunity from small-pox mortality, whether it is greater or less than that of Leicester?—It cannot be less than that of Leicester, it may be the same, because we have no small-pox mortality at all.

16,483. In the course of some years you have had some cases?—There have been numerous imported cases, but no deaths.

16,484. No deaths at all?—No, none at all. There have been no deaths in Leicester from small-pox for eight or nine years.

16,485. Your return shows a certain number of deaths in the last 10 years?—The last death took place in 1883.

16,486. But you have not inquired whether the other large towns have had a mortality less or greater than Leicester?—I have made some inquiry of the kind, I have noticed again and again the returns which have been published and the paragraphs which are abstracted frequently from the Registrar-General's returns referring to odd cases of small-pox here and there.

16,487. It would show very much the advantage of the Leicester system if you could show that the other large towns had a larger mortality than Leicester?—Yes, if that could be done; but if not it would not necessarily follow that this was any argument against the Leicester system.

16,488. Not against it, but if they have not a larger mortality it would apparently show the Leicester system to be of less value than it is estimated at. For example, I have a copy of the deaths at Leicester, according to your own returns in 16 years, they have been 18, those years beginning with 1874, when there were no deaths; in 1875 there was one; in 1877 there were six deaths; in 1878 there was one death; in 1881 there were two deaths; in 1882 there were five deaths, and in 1883 there were three deaths, so that in the 16 years the total deaths in Leicester have been 18?—Yes; but those include deaths of vagrants, and some other imported cases.

16,489. I find the same mortality practically in Wolverhampton, where they have had 17 deaths in 16 years?—No doubt there have been the same number of deaths,

but this does not necessarily show the same rate of mortality.

(*Sir William Savory.*) You do not know the populations?

(*Chairman.*) No, I do not know that. Then I find in Portsmouth there are only 11 deaths in 16 years.

(*Witness.*) Might I ask whether those are the same 16 years?

16,490. Yes; and in Norwich, in the 16 years, there have been only five deaths?—In all probability, in those towns they would not have had the same number of cases, or the very large number of importations, that we have had to contend with.

16,491. (*Professor Michael Foster.*) Not in Portsmouth?—I cannot say, but even if they had I do not know that any comparison of this kind would be at all detrimental to Leicester.

16,492. (*Chairman.*) But I think your argument has been that such protection as you have in Leicester would exclude small-pox, but that the absence of such protection would not?—Our system does not necessarily exclude importations of small-pox, but I have shown that we are able to deal successfully with them without recourse to vaccination.

16,493. Then what do you regard as having been the means of protection in those other towns?—If they have had small-pox, I do not see how they have been protected.

16,494. There have been 17 deaths in the 16 years in Wolverhampton, what protection has Wolverhampton had?—I do not know that it has had any specific protection beyond what is claimed for vaccination.

16,495. Then you would admit vaccination to be a protection?—I do not admit vaccination to be a protection. I was simply using the word in its ordinary acceptance.

16,496. Then Wolverhampton has had no protection?—No real protection beyond that of the general sanitary condition of the town.

16,497. (*Sir Charles Dalrymple.*) If vaccination is no protection, then the other towns are just as well off as Leicester, with its isolation?—But what I wish to emphasize is that Leicester without vaccination is as well off as other towns.

16,498-9. (*Chairman.*) Do you know whether any of those towns isolate?—In some towns I know they adopt a system of isolation, but I could not just now inform the Commission as to how many. I do know, however, that everywhere where they have hitherto relied upon vaccination alone, they now find it must at least be supplemented by isolation and other sanitary measures.

16,500. (*Mr. Pierson.*) I suppose you wish to show amongst other things that, whatever may be the value of vaccination, if the Leicester system is adopted you do not need to enforce vaccination?—Quite so; there is no need for vaccination if isolation and other kindred measures are competent to cope with outbreaks of the disease.

16,501. (*Chairman.*) But take Norwich, which I am sure does not practise isolation, might not they say there is no need for isolation where you exercise vaccination?—If such were the case, no doubt they would say so; but what I have said of Leicester would be a standing proof the other way.

16,502. Would not Norwich be equally a standing proof of the non-necessity of isolation?—If you can inform me that it is not carried out there, it might be so as regards hospital isolation, but I am of opinion it is carried out there to some extent.

16,503. But if practised anywhere you would have heard of it surely?—I have heard of it at South Shields, and other places which I cannot just now call to mind, and I also know this, that after the epidemic arose in Sheffield, notwithstanding their professed reliance on vaccination, measures similar to ours were resorted to there. A hospital was built outside the town, and an endeavour was made to cope with the epidemic on sanitary lines.

16,504. But in all those towns we learn from the Registrar-General, that there is not more small-pox than there is in Leicester, and people ascribe their immunity to the practice of vaccination?—I think the experience of Leicester rather disputes such conclusions, wherever made, because we certainly have not vaccination to fall back upon.



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16,505. And those other towns are not protected by isolation?—I do not know that we are protected by isolation; we only regard it as one amongst other safeguards in case an epidemic breaks out. Perfect sanitation alone affords adequate protection against disease.

16,506. Do you think that those towns are in no sense protected by vaccination?—I do not think they are in any sense whatever. In fact I should consider their susceptibility to be rather increased, as I regard vaccination as an insanitary operation.

16,507. Do you think there were any instances before vaccination in which small-pox was introduced into towns and no great mortality occurred?—Might I ask whether that question alludes to the earlier part of this century?

16,508. To any time before vaccination. Could you find any example of one of the large towns of England into which small-pox was introduced when there was neither vaccination nor isolation in which it did not spread to a larger extent than this?—I should think that a large number of such instances could be adduced, and that there were a large number of towns which did not suffer from small-pox to any serious extent.

16,509. After small-pox had been introduced into them?—Yes, I should think there would be many.

16,510. Could you bring any examples bearing out that view?—I do not know whether I could without further investigation. But we know that there were years in which epidemics rose and fell, just as they have done since vaccination has been introduced.

16,511. But speaking of towns where the small-pox mortality has been by some means of protection limited, if one town claims it for isolation, another may with equal justice claim it for vaccination?—As I said before I do not know that we claim protection by isolation alone. I simply say that we are competent to deal with small-pox when it breaks out, and to prevent it spreading without recourse to vaccination.

16,512. Your idea is that isolation is to a great extent a protection, and that other towns in which they have as small a mortality without such isolation are not protected by vaccination?—Yes, isolation is protective against the spread of the infection on an outbreak of small-pox.

16,513. And you do not admit of the protection by vaccination?—I do not admit of that at all.

16,514. (*Mr. Picton.*) Is not there this difference between Leicester and Wolverhampton and other towns, that compulsion is in force in those towns and not in Leicester?—There is that difference, which is a very important one.

16,515. If Wolverhampton be really protected by vaccination they are protected by compulsion, that is to say, by law?—That would be so, on the assumption, of course, that vaccination is protective.

16,516. If Leicester is protected, it is not protected by compulsion of law?—No, compulsory vaccination is abolished in Leicester, and we rely upon voluntary action.

16,517. (*Dr. Collins.*) Your notification Act came into force, I think, in 1879?—Yes.

16,518. Prior to that time there were very few other towns which had similar Acts?—Very few indeed.

16,519. They would, however, all be equally under the Public Health Act of 1875?—Yes.

16,520. May I call your attention to paragraph marked N.B. at the bottom of page 189 of Shaw's Manual of the Vaccination Law, in the instructions to Vaccination Officers by the Local Government Board, which is to this effect: "The isolation of the sick, the disinfection of infected houses, and the disinfection or destruction of infected things, are very important means of checking the spread of small-pox; and in order that such measures may be enforced, the Public Health Act, 1875, besides imposing penalties on the exposure of infected persons, the letting of infected houses, the sale of infected things, and other acts similarly dangerous to the public health, gives very important powers to sanitary authorities." It would be correct to say, would it not, that under that Act towns like Norwich and Wolverhampton would have considerable powers of effecting some measure of isolation and restriction upon the spread of small-pox?—They would have considerable powers under that Act, and these

powers would be just the same in those towns as in Leicester.

16,521. Do you think that those powers may possibly have operated in the direction of reducing the mortality from small-pox in those towns other than Leicester to which the Chairman has called attention?—I think they would have that tendency undoubtedly, and their comparative exemption from small-pox, already alluded to, may much more reasonably be attributed to this cause than to vaccination.

16,522. (*Sir Guyer Hunter.*) Now with reference to Mr. Picton's question put to you at our last meeting. Question 16,317, as to Leicester dealing with the infection of small-pox within its own borders, will you tell me whether I am not right in assuming this—that the small-pox hospital instead of being within the borough of Leicester is outside, namely, in the sanitary district of Blaby?—It is at present just outside the borders of Leicester, in the sanitary district of Blaby; but the infectious hospital was formerly within the borough of Leicester.

16,523. Am I not right also in assuming that when Leicester deaths from small-pox occurred in the hospital they are returned by the Registrar-General as having taken place in the Blaby district and not in Leicester?—You are perfectly right in that; I explained it fully to the Commission when I began my evidence; but locally our Medical Officer of Health includes them in his report.

16,524. In his annual report for 1883 the Medical Officer puts three deaths down as due to small-pox in Leicester, while the Registrar-General in his account for that year puts down no small-pox to Leicester, but reports three small-pox deaths as occurring in Blaby. Those, I assume, are really Leicester deaths; am I right in assuming that?—I do not know that you could call them Leicester deaths. I scarcely understand the expression.

16,525. From small-pox occurring in Leicester?—But in that year there were some cases brought from Barrow and Goadby, besides several tramps.

16,526. I am only giving the fact. The Medical Officer puts down those cases as having occurred in Leicester, the Registrar-General reports them as having occurred in Blaby. I assume those three small-pox deaths which the Registrar-General refers to are the same as those referred to by the Medical Officer?—Yes, they are the same.

16,527. In reply to Professor Michael Foster at Question 16,184 in the proceedings of the 27th of May, you imply, I think, that when in 1872 small-pox was prevalent, and you had 346 deaths, the general mortality was no higher than in healthy years. I think you made a statement in the "Vaccination Inquirer" in 1888 that the general mortality for 1872, excluding small-pox, was exceptionally low, but with small-pox, which according to your statement included 312 deaths, the total was 104 above the previous year, and 196 above the succeeding year. 1872 was in fact the highest but one of the decade as regards total mortality, but you give, if you recollect, in that "Vaccination Inquirer" ten years in which you put it down that in 1872 the general mortality was no higher than in healthy years, whereas it was considerably higher than in any of the whole decade except 1875, when the increased death-rate was due to epidemics of scarlet fever which caused 115 deaths, whooping-cough 91, and diarrhoea 308 deaths?—Are you alluding to the table in the "Vaccination Inquirer" or to the statement made there?

16,528. I am alluding to the statements made by you in the "Vaccination Inquirer" of March 1888?—It is rather a long article to look through unexpectedly for any particular point, and on the spur of the moment, but I should like to say about that table in the "Vaccination Inquirer" you will find that the whole of the small-pox deaths, 346 for 1872, are put down, and not 314, as you seem to allege. I have already made a general statement to the Commission that although those cases of small-pox were removed to a hospital outside the borough, and were registered by the Registrar-General as occurring in the Blaby Union, yet our Medical Officer had always included them in the mortality of the borough of Leicester.

16,529. I am not for a moment insinuating that you wished to mislead the Commission, I merely wish to have that matter perfectly clear that the hospital was



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not inside Leicester, but was outside Leicester in the sanitary district of Blaby, and that the Medical Officer reported deaths as occurring in Leicester, they really were reported by the Registrar-General as occurring in Blaby?—Yes, I have explained that fully. We include all deaths of Leicester people occurring at this institution, but the Registrar-General excludes them. Locally we register them as Leicester deaths.

16,530. (*Dr. Collins.*) Am I right in saying that the Fever Hospital, although situate within the Blaby Union, is only a few hundred yards outside the boundary of the Leicester borough?—Yes, about 500 yards from the present boundary, but it will soon be included within the borough. It was built upon a piece of land belonging to the Corporation just outside the borough to meet the epidemic which arose in 1872. Previously to that time the whole of the infectious cases were dealt with inside the borough at a hospital which is now abolished.

16,531. With regard to the three cases which terminated fatally in 1883, which I gather from Sir Guyer Hunter had been returned by the Registrar-General as occurring within the Blaby Union and by the Medical Officer as occurring in Leicester, I gather from the report of that year that those cases came from Argyle Street, is that within the borough?—Yes, Argyle Street is within the borough; but I should like again to explain that cases of small-pox are brought from nearly the whole of the county to our hospital, so that deaths occurring there are not necessarily those of the inhabitants of the borough. In this year, 1883, three patients came from the country districts of Barrow and Goadby, both of which would be 10 or 12 miles from Leicester. Barrow is in the Barrow Union and Goadby is in the Billesdon Union, so that deaths occurring at the hospital would not necessarily be deaths of Leicester people.

16,532. (*Chairman.*) Does that conclude what you wish to say with reference to the importation of foreign disease?—Before leaving the subject, I wish to allude to the cost of our system as compared with the cost of vaccination, and I will now put in Table 10 for that purpose. (*The table was handed in. See Appendix III, Table 10, page 435.*) This table shows for the borough of Leicester the number of persons who voluntarily entered the quarantine wards at the Fever Hospital after possible exposure to small-pox infection, with the estimated cost of such cases; also the number of small-pox cases for each year from 1874 to 1889. The cases of small-pox are given merely for purposes of comparison. I think that each Commissioner has a print of the table before him. This table has for the most part been compiled from the reports of the Medical Officer of Health; but the figures marked with an asterisk have been obtained principally from information supplied by the chief sanitary inspector, no exact records having been kept of quarantined persons until 1886. For each of the four years 1885 to 1888 the Medical Officer of Health has published the weekly cost of each hospital patient, including quarantined persons, this you will find in the health reports for those years. He there takes the maintenance of a person in quarantine to be equivalent to the cost of an ordinary patient. On this basis of calculation the average cost of the 65 persons quarantined during the years 1885 to 1888 was a fraction under 2*l.* 11*s.* 1*d.* for each person for the usual quarantine period of 14 days. This rate has, therefore, been taken in the above table as a fair average for the years 1877 and 1878, and 1881 to 1884, for which years there is no exact official information. The total cost from 1874 to 1889 has been 467*l.* 6*s.* 2*d.* The actual cost of public vaccination, according to the official returns, from 1874 to 1889 was 4,909*l.* 1*s.* 5½*d.* To the cost of public vaccination must be added the approximate cost of private vaccination and re-vaccination as being at least of equal amount, giving a total of 9,818*l.* 2*s.* 11½*d.* The cost of quarantine from 1874 to 1889 was 467*l.* 6*s.* 2*d.*, the amount paid during the same period as compensation for the destruction of clothing, bedding, &c. was 11*l.* 5*s.* and the approximate cost of disinfectants used was about 10*l.*, making a total of 488*l.* 11*s.* 2*d.*, showing a saving in favour of the Leicester method of 9,329*l.* 11*s.* 9½*d.* But if the cost of public vaccination from 1874 to 1889 had been maintained at the rate prevailing from 1869 to 1883, namely, an average of 362*l.* 15*s.* 9½*d.* per annum, the cost of public vaccination for the years 1874 to 1889 would have been about 5,804*l.* 12*s.*, so that the 4,909*l.* 1*s.* 5½*d.* would have been increased by another amount of 895*l.* 10*s.* 6½*d.*, and then making a similar addition for private

vaccination of 895*l.* 10*s.* 6½*d.*, we obtain a further additional saving of 1,791*l.* 1*s.* 1*d.*, showing a total saving in favour of the Leicester method as against vaccination for a period of 16 years of 11,120*l.* 12*s.* 10½*d.* Of course in our judgment we believe the whole expenditure for vaccination during these 16 years has been entirely useless. And looking at the observations which have at various times been made by our Medical Officers of Health, who all of them were believers in vaccination, we shall find in their reports, upon an outbreak of small-pox, scarcely any reference to vaccination, but always a distinct reference to the important influence exercised by sanitary measures in stamping out the disease. We, therefore, regard this expenditure of 488*l.* 11*s.* 2*d.* as being sufficient to have kept the town free from small-pox for those 16 years, apart altogether from the great expenditure upon vaccination. Some statements have appeared, and I think a question was addressed to Alderman Windley, the chairman of our sanitary committee, when he was before the Commission as to the compensation paid to those who were in quarantine. I think the question arose whether those who were put in quarantine were paid their usual wages. I made an inquiry with regard to this at the town hall, and I received the following letter from the town clerk: "DEAR SIR, Referring to the conversation I had with you at the sanitary committee meeting last Friday, I am now in a position to confirm what I then stated to be my impression, *i.e.*, that no payments were made in lieu of wages or as compensation to persons who were isolated in the quarantine ward in connexion with any of the discovered cases of small-pox in our borough. I have had the books of the accountant searched, and the above is the result.—I am, dear Sir, Yours faithfully, JNO. STOREY, Town Clerk." I have here a detailed account of the amounts paid as compensation for the destruction of bedding, and so on. For the year 1877 there was paid to one person the sum of 1*l.* 10*s.*, to another a sum of 5*l.*, to another a sum of 2*l.*, and to another a sum of 2*l.* Since that time there has been only one payment, namely, on June 12th, 1886, for value of bedding destroyed, 15*s.* I think this is sufficient evidence to prove that no compensation has been paid in the shape of wages, and that all that has been done in carrying out our system has been to reimburse those whose articles of furniture have been destroyed.

16,533. (*Professor Michael Foster.*) Can you explain why the cost per 14 days is as low as 1*l.* 10*s.* in 1885, and as high as three guineas in 1888?—The lower average cost was due to the fact that there were a larger number of patients in the institution in 1885.

16,534. But you had 39 patients in 1888, when you charged them 3*l.* 3*s.*, and when you only had 10 in 1885 you charge them 1*l.* 10*s.*?—But you are referring to small-pox cases alone; these figures are taken in connexion with the whole of the patients in the hospital.

16,535. Does this only tell us what is the general cost of the hospital?—I have explained that the Medical Officer took the cost of a quarantined person to be the same as the cost of an ordinary patient.

16,536. (*Mr. Picton.*) Those persons put in quarantine only cost the same as the average cost of a patient in the hospital?—Yes; that is explained in my note to the table.

16,537. (*Professor Michael Foster.*) Then the cost of your small-pox would depend upon the number of patients in your hospital from other causes?—Yes; that would regulate it to some extent.

16,538. I thought this being a tabular statement gave us valuable results?—So it does. We maintain the hospital, whether we have any small-pox or not; the establishment charges go on just the same, and the addition of those quarantined persons tends rather to reduce the average cost per head for the hospital.

16,539. It is simply the effect upon my mind of being put in a tabular form that this was a definite statement as regards the cost?—So it is. The statement is definite, although the cost varies.

16,540. Now it appears that it is highly contingent upon a great many other factors having no relation whatever to small-pox?—But I have explained all those other factors, and they apply to fever hospitals and hospitals for infectious diseases already established all over the country, as well as to our Leicester hospital. In fact we have no special expenditure for a separate establishment entirely devoted to dealing with small-pox.



16,541. (*Sir William Savory.*) I suppose the isolation department is part of the Fever Hospital?—It is part of the Fever Hospital.

16,542. Is it in one block?—It is in one block; but there are five or six blocks altogether to the hospital. I showed the ground plan to the Commission last week.

16,543. How many blocks are given up to quarantine in that building?—One block is set apart for quarantine, but at times two have been used.

16,544. In those blocks you would have nothing but quarantine patients?—Nothing but quarantine patients.

16,545. Then the expense of the blocks must to some extent be taken into account?—It would not be practicable to separate the expense of one block from that of the other blocks of the establishment.

16,546. But it is part of the expense. You may have had them already built, but those towns which had not them already built would have to build them; you must take account of the lodging as well as the board?—It would be impossible for me to explain what the cost might be to other towns; I am simply stating what it has actually been to us, and which would probably be a fair average amount for other towns.

16,547. What is the distance of the blocks from each other?—I really could not tell you exactly how many feet, probably 40 or 50 feet.

16,548. (*Mr. Bright.*) I suppose in this charge you do not merely charge for food; it is a charge for lodging upon the capital expended upon the building?—It is for food principally. But it also includes the cost of medicines, wines and spirits, disinfectants, salaries and wages of staff, exclusive of the Medical Officer of Health, and sundry items of household expenditure.

16,549. Nothing is included for lodging?—No, but the amount includes rates, taxes, bedding linen, repairs, and similar expenses.

16,550. (*Mr. Dugdale.*) Then is the proportion of general expenses for each patient large or small according to the number of patients in the hospital?—Yes, as a matter of course; but this would apply to all hospitals alike.

16,551. (*Mr. Meadows White.*) I understand that this is the proportion of current expenditure; there is nothing in it for capital expenditure?—There is nothing in it for capital expenditure, it is the current expenditure for the year.

16,552. Divided by the number of patients you would get at the sum per patient, and in that number of patients those quarantine patients are included?—Yes, the Medical Officer states how he arrives at the result. He takes the number of days the whole of the patients have been in the hospital and he then ascertains the cost per patient per week; and it is obvious that those quarantine patients who are only in the hospital 14 days would not be so expensive to the institution as patients who would remain there for weeks or months.

16,553. (*Dr. Collins.*) I suppose you would not contend that the construction and arrangements of your hospital are incapable of improvement?—By no means. I should like to see a very great improvement. At the present time the sanitary committee is considering the question of building a new hospital.

16,554. Is the question before them of separating the fever from the small-pox patients?—The whole question of dealing with infectious diseases is before them. I do not know what the result will be, but a special committee has been appointed to visit other hospitals in the country.

16,555. (*Sir Edwin Galsworthy.*) You told the Commission that there was one ambulance for both fever and small-pox patients. Have you had any instances where fever has been given to a small-pox patient by using the ambulance, or *vice versa*?—I have no knowledge of such an instance. Perhaps I might supplement that statement by saying, that just recently the sanitary committee have purchased a new ambulance van because the old one was nearly worn out. They have decided to have the old one repaired, so that, as a matter of fact, we shall have two vans, but we have only one horse, and only purpose using one. By retaining the old vehicle we shall be able to lend one, should occasion arise, to other sanitary authorities.

16,556. (*Mr. Dugdale.*) When you have finished your statement of facts as to the Leicester system, I want to ask you a question or two. May I put it that this

would fairly state your argument: that the Leicester system brings an unvaccinated town up to the same level of health with regard to small-pox as a vaccinated town; that it brings Leicester up to the same level of health with Norwich, for example?—Yes, or even to a higher level, if you include our whole sanitary system.

16,557. Therefore, you say if the Leicester system is adopted compulsory vaccination would become unnecessary?—Altogether unnecessary.

16,558. Now, I ask you to state 'shortly' what the Leicester system is; I understand you to say this, first of all, that you must have prompt compulsory notification of the disease?—Yes. That exists all over the country as well as in Leicester.

16,559. You must have to start with prompt compulsory notification of the disease when it arrives?—Yes.

16,560. Then in order to obtain that you must have a sanitary inspector with unremitting zeal, as you believe your man at Leicester is; you must have a very zealous sanitary inspector?—I do not know that it is necessary to have one specially zealous. They should all carry out their duties properly.

16,561. Then on obtaining a notification of the disease the patient must be at once transported to your hospital?—If in a condition and willing to be removed, and assuming there are no means for isolation in the patient's home.

16,562. Of course if in a condition to be removed, and after he is transported to the hospital the whole of the members of the family, or the persons living in the house, must be taken there to be put into quarantine?—Not necessarily. It depends upon circumstances, and the amount of risk from infection.

16,563. But the perfection of the system, I take it, would be to remove everybody who had been in contact with the infected person and put them into quarantine?—Yes, and we do persuade them to go if possible.

16,564. So you say that if you can get the disease notified at once, and that everybody who has been in contact were put into quarantine at once, there you have the Leicester system perfect?—You would have gone a long way towards it.

16,565. If you cannot obtain the admission to quarantine of everybody who has been in contact in the house with the infected person you may leave some person at large to spread the disease in the town?—Such persons have been occasionally left, but no such spreading of the disease has followed.

16,566. What you have to show to make out your case against compulsory vaccination is this, as I understand it, that the system which you say has been successfully carried out in Leicester can be applied generally all over the country?—I know no reason why it should not be, and with equal success.

16,567. How do you propose to apply it to a large town like London?—Just as easily as it could be applied to Leicester.

16,568. Have you thought of the difficulty of applying it to a large city like London?—Yes, London is divided into districts, just as Leicester is divided into districts. Each district is placed under a sanitary inspector, and I do not see why the larger place should not be divided into districts and dealt with in the same way as the smaller one.

16,569. I do not suppose you would suggest that there are the same facilities for carrying out the Leicester method in a large town like London as there would be in a small town like Leicester?—There might be certain difficulties of distance, but these could readily be met by increased facilities of transport. But whatever the difficulties may be, I do not consider them insuperable.

16,570. Suppose a large drapery or other business in London where people sleep on the premises, how would you deal with that in case of small-pox appeared even in one of those places of business?—The case would be removed and it would be at the option of the others who had been in immediate contact to go into quarantine just the same as it is in Leicester.

16,571. But would you think your Leicester system could be carried out if they refused to go. Would it not be necessary to make it compulsory to take them?—There would be some risk.

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16,572. Would it not be necessary to make it compulsory? Surely your quarantine is more valuable as it becomes more universal, and if there is no practical quarantine your Leicester system would break down, would it not?—I do not know that it would. In our experience of 14 years it has not yet broken down. They do not like compulsion in Leicester. I would refer you to one or two cases where the Medical Officer stated that persons have refused to go into quarantine, and in which the persons who came into immediate contact with the patients alone were removed, while in immediate contact went into quarantine. There was the case I referred to where the father and mother and four children in the same house absolutely refused to go at all. I have a list of those who have refused to go. But in a large establishment such as you have referred to if the case had been removed, and if those who had come into immediate contact with it were also removed, I should say that this would be all that was necessary.

16,573. But in a large shop where people live on the premises and dine together there would be a large number who would come into contact with the infected person. No one would know who was infected until the 14 days had expired?—So it would be in Leicester.

16,574. But I understood you to say that in Leicester the cases came from houses where there were comparatively few persons in contact with them?—Although what I have said may not apply to any particular public establishment in Leicester, yet most of our cases come from densely crowded localities far worse in their sanitary surroundings than the establishments you refer to, and therefore even more liable to spread infection.

16,575. You must realise the fact that the large business establishments in London must be very different from the smaller establishments in Leicester where they probably do not live on the premises?—There would be that difference of size, but that is all.

16,576. If your quarantine is to be effective it must be as universal as possible, and the less universal it is the less effective it must be?—The less effective it might be, but not necessarily must be.

16,577. It must be, because the more people who escape into the world who have been in contact with the infected person, the greater chance there is that some one of them may have the infection in him and may spread it to somebody else?—Yes, there might be a greater chance of infection, but we have always successfully coped with it whatever the danger might have been.

16,578. I quite understand your system; I am not complaining of it, but it strikes me that it depends so much upon the enforcing a strict and thorough system of quarantine?—But even if that were so, take a town where vaccination is usually practised and fully carried out, they fall back upon similar measures, because they find that they have no better means of dealing with it than those we have adopted. Even to come to an establishment where the whole of the inmates were vaccinated they would still be compelled in case of an outbreak to fall back upon some such system as ours.

16,579. But they would say they are protected by their vaccination, and so they are, because they have no system of quarantine and isolation, and have no more small-pox cases than you have in Leicester?—They do say so; but in almost all outbreaks we have had in Leicester the first cases have been those of vaccinated persons, which does not say very much for their protection.

16,580. I understand you to say that there is no more difficulty in carrying out the Leicester system in London than there would be in Leicester; but you have not considered the question, I suppose, very closely?—The only necessary difficulty I can see would be this: that in large communities there are undoubtedly greater liabilities of infection to overcome; but, apart from London being a larger community, I really do not see any insuperable difficulty in carrying out the system thoroughly. It would only require a larger staff of officials for the larger area.

16,581. Then, of course, there is the further difficulty which would strike you in a moment, that London being a large seaport, and vessels coming into the docks, that would make it additionally difficult to deal with it?—There may be greater liability to infection from

that cause, but that would apply to all seaports, I presume, equally with London.

16,582. It would apply to all seaports equally, and would make it all the more difficult to carry out your system in seaports?—It would be more difficult there, but with a rigorous system of immediate inspection on arrival of suspected vessels our system could be readily applied.

16,583. (*Mr. Meadows White.*) What accommodation have you in your quarantine wards, for how many persons?—I cannot tell you the exact number we can accommodate, but I should think 50 or 60.

16,584. That you think is quite sufficient for a town the size of Leicester?—We have found it sufficient up to the present time because the highest number we have had to quarantine in any one year was only 39 cases.

16,585. Now, I will ask you whether in your opinion there has been anything like that condition as to epidemics in the country that there was in 1872, since you tried your quarantine system?—There have been conditions existing in Leicester itself which were equivalent to the conditions existing at the commencement of the epidemic of 1871–72, and which epidemic conditions have been successfully overcome.

16,586. Is that your view that there have been epidemic conditions in the country at all like those of the epidemic of 1872?—Possibly not in the country at large, but there certainly have been such conditions in Leicester.

16,587. There have been two or three cases I understand?—Yes, but beyond that the Medical Officer himself says certain conditions have existed which but for the adoption of these measures which I am advocating would have led to an epidemic.

16,588. But we all know the extent of the ravages of small-pox as an epidemic in 1872, has there been existing in the country anything like those conditions since your quarantine system came in?—I do not think there has been in the country at large.

16,589. Do not you think the condition of things in the country at large has a striking effect upon the probability of an epidemic occurring in any part of it?—No doubt it would have some effect speaking generally, but there have been local epidemics of considerable severity, such as that at Sheffield.

16,590. Have you tried your system upon any other infectious disorder than small-pox?—I do not think we have.

16,591. You have not attempted, for instance, to isolate or keep scarlet fever patients in quarantine?—No; we do not quarantine small-pox patients at all, but only those persons who are supposed to have contracted the infection. But the scarlet-fever patients remain in the convalescent ward during the period of desquamation. The subject of quarantine for scarlet-fever patients has come up before the sanitary committee, but it has not been carried out although it was thought to be desirable.

16,592. (*Mr. Bright.*) Your attention was directed to the disadvantage from which London would suffer in regard to the adoption of quarantine measures owing to the large drapery establishments and so on where numbers of people live together; would not Leicester suffer also in the same way; have they not the disadvantage there of having a great many large factories, such as is certainly not the case in London, where people work together in large numbers and might thus infect each other?—Certainly, and there are also a number of large drapery establishments in Leicester, perhaps not of quite such magnitude as those in London, but still very large ones.

16,593. And there are great factories where people work together, are there not?—Yes, very large ones indeed.

16,594. One would think that the infection might come from one case and infect a large number of people in the same works?—This has actually been the case, some persons sent into quarantine have been persons working in the factories. The persons actually suffering from small-pox have been taken to the hospital. In addition to this, the sanitary inspector has paid a daily visit to the factory for 14 days to ascertain whether any other person fell ill of the disease.

16,595. Suppose any person working in a factory fell ill with small-pox, would it be considered that those



working next to the person, or frequently in contact with the person, should be removed to quarantine?—It would be felt to be desirable.

16,596. And it has been done?—I think it has been done.

16,597. (*Mr. Meadows White.*) How many cases out of those 183 were the cases of persons taken out of a factory to the quarantine hospital? I understood that they were persons from the house in which the case occurred, but in how many cases were they taken from a factory?—I could not answer that question definitely without making further inquiries.

16,598. (*Mr. Picton.*) You were asked just now about your dependence upon the zeal of the sanitary inspector; is it not the duty of medical men and the medical practitioners in the town to report all cases of small-pox which come within their care?—Undoubtedly it is.

16,599. So that you are not only dependent upon the report of the sanitary inspector?—Not by any means upon that alone.

16,600. You are aware that a general Act has been passed making it compulsory upon all heads of families to notify to the sanitary authorities the existence of infectious diseases?—We had that proviso in our Act of 1879.

16,601. But are you aware that it has been made general throughout the country now?—Yes, I am aware of the passing of the general Act.

16,602. That is one step towards the procedure you are pursuing in Leicester, is it not?—Yes, the first step.

16,603. (*Mr. Dugdale.*) But I believe the Act has to be adopted by the local authorities?—I think a large number of towns have already adopted it.

16,604. (*Mr. Picton.*) In a case in which people remain in a house attacked by small-pox refusing to go into quarantine, is it found practicable to enforce a certain amount of isolation by giving notice to all the neighbours, and setting an officer to watch the house to see that people do not go in without his knowing?—That has not been tried; an officer has called at the house, but the matter has not been noised abroad.

16,605. With reference to London, you are aware that vaccination is pretty well carried out in London, notwithstanding the greatness of the population?—Yes, there appears to be little difficulty in accomplishing that.

16,606. Are you aware how that is done?—I presume it is carried out in the metropolis as at Leicester and other towns.

16,607. By the local officers each having charge of a certain district?—Yes.

16,608. Would not that apply equally to the reports of the disease and their treatment by isolation?—Yes, however large the population that plan could easily be adopted.

16,609. (*Dr. Collins.*) Mr. Dugdale pressed the case of London upon your attention; might I read to you the following quotation from the minutes of the managers of the Metropolitan Asylums Board for 1888-9, in which they state that "only 56 small-pox patients have been admitted into the Board's hospitals during the year 1887. The immunity of the inhabitants of London from this type of infectious disease may not unfairly be at least in part attributable to the prompt measures adopted by the managers

"for the removal to the hospital ship at Long Reach of the few cases which did occur in the metropolis from time to time during the year, and partly to the steps that were taken by the several Medical Officers of Health to trace and deal with the probable source of infection in each individual case." That would tend, would it not, to show that London provided with compulsory means of notification has been able, to some extent, to follow the example of Leicester in dealing with cases of small-pox?—Yes, the extract you have just read proves conclusively the truth of the statement I previously made, to the effect that, notwithstanding their professed reliance upon vaccination, other towns are now following the example of Leicester.

16,610. I find from the minutes of the managers for 1890-91 this statement, "Only five cases of small-pox were admitted into the hospital ships at Long Reach during 1889, which shows that the metropolis enjoyed special immunity from the disease, an immunity which may be again ascribed to the prompt notification of the cases to the Medical Officers of Health for the districts from which the patients were removed, and to their immediate removal to, and isolation at, Long Reach." I believe in London it is not the practice to remove those who are not infected to quarantine, is it?—I do not think it is the practice to remove any besides those who are actually infected.

16,611. You answered some question of Mr. Picton with reference to vaccination in the metropolis, are you aware whether the proportion of successful vaccinations to births has been increasing or decreasing in London in the last three or four years?—It has been slightly decreasing.

16,612. I see that the deaths from small-pox in London were 1,404 in 1885, 24 in 1886, nine in 1887, nine in 1888, and one in 1889?—Yes, small-pox is also decreasing.

16,613. Some questions were put to you as to whether the Leicester method had been tested by anything which could be fairly called an epidemic; do we know anything of an "epidemic constitution" except the fact of a number of people suffering from small-pox?—No, I believe not. I suppose that constitutes an epidemic.

16,614. The older writers alluded to what was called "an epidemic constitution of the atmosphere," perhaps you are not able to say whether that is or is not regarded as a rather antiquated notion nowadays?—I could not answer that question authoritatively, but I should say that atmospheric conditions have unquestionably an influence upon epidemics.

16,615. You also claimed, I understand, that your system as applied to Leicester was capable of bringing Leicester, as regards small-pox morbidity and mortality, to the level of other towns with their vaccination?—I believe it has kept it rather above their level.

16,616. I believe in the case of Sheffield your Medical Officer suggests that if they had been provided with similar means, the epidemic from which they suffered recently might have been kept within narrow bounds?—Yes, he states that, and I believe it to have been his honest opinion, although he is a strong believer in vaccination.

16,617. (*Mr. Picton.*) As to the man mentioned in the report for 1887 who is here put down by the Medical Officer as unvaccinated, but who told you that he was in the army and had been vaccinated, can he be produced?—No; he has now gone to America. But I have a copy of his letter here if the Commission would allow it to be read.

Mr.  
J. T. Biggs.  
10 June 1891.

Adjourned till Wednesday next at 1 o'clock.



## Sixty-ninth Day.

Wednesday, 17th June 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.  
Mr. JOHN STRATFORD DUGDALE, Q.C., M.P.

Professor MICHAEL FOSTER.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

Mr.  
J. T. Biggs.  
17 June 1891.

16,618. (*Chairman*.) What is your next point?—The last question at the previous meeting was put to me by Mr. Picton, on which I have something to lay before the Commission.

16,619. (*Mr. Picton*.) I asked if you would put in the letter from a soldier who was alleged to have been unvaccinated, but declaring that he was successfully vaccinated in the Army?—I have that letter here, and also a copy of it.

16,620. (*Chairman*.) He does not say himself whether he bore any marks of vaccination?—No, he does not say that.

16,621. Will you read the letter?—"I, George Henson, do certify that I was vaccinated at Northampton in the year 1877, at the Militia Stores, by the Army Surgeon and was passed as being successfully vaccinated. In December 1887 I was seized with small-pox and was taken from my home, 176, Brandon Street, Belgrave Road, Leicester, to the Small-pox Hospital, December 14th, and came out on March 3rd, 1888. The Medical Officer, Dr. Tomkins, classified me on my card as unvaccinated, although I had told him in reply to his inquiry that I was vaccinated when I went into the Militia."

"(Signed) GEORGE HENSON.

"June 14th, 1888."

16,622. Where does he write from?—This letter was written at his home in Brandon Street where he then resided.

16,623. He was not abroad when he wrote this letter?—No, he wrote that before he left for America in 1888. His case is referred to at page 14 of the Medical Officer's report for 1887.

16,624. (*Mr. Picton*.) You personally saw the man?—Yes, I saw him; I was present when he wrote this statement. I visited him on account of information which had been conveyed to me.

16,625. (*Chairman*.) This was the only case from Brandon Street at that time, the 14th of December?—The rest of the family were removed to quarantine, but his was the only case of small-pox.

16,626. There is no question that this was the case referred to by Dr. Tomkins in his report?—No question whatever; this was the only case from Brandon Street.

16,627. (*Professor Michael Foster*.) It appears that Dr. Tomkins returned him as unvaccinated, although the man had told him that he had been vaccinated?—Yes, the man distinctly told him that he was vaccinated.

16,628. Do you know whether they vaccinate all those who go into the Militia?—I believe they are all vaccinated on entering the Militia. The reason why I alluded to this case more particularly was in consequence of some references made at the last sitting of the Commission to cases in the 1888 report; there appears to be a strong tendency to certify those who suffer severely from small-pox as being unvaccinated and those who suffer slightly as being vaccinated.

16,629. (*Chairman*.) What is the next matter to which you wish to refer?—I should like now to refer to a question which was put to me by Sir William Savory on the last occasion, Question 16,468, as to whether I could obtain a certificate from the medical man respecting case VI. referred to at page 13 of the medical officer's report for Leicester for the year 1888. I communicated with the medical man, and he sent me this letter last night:—"Prebend House, London Road, Leicester, June 16th, 1891. Dear Sir,—In reference to your inquiry as to the condition of the eyes of the child referred to as C. M. L., Case VI., in the Medical Officer's annual report for 1888, at page 13, having been the medical attendant of the family for ten years, I can certify that the child had suffered from ulceration of the cornea before she was attacked by small-pox. From repeated examinations which I have made since the child recovered I am able to say that her eyes are no worse than before her illness. If anything they are better, and her general health is much improved. Yours truly, CHARLES LAKIN, L.R.C.P., &c."

16,630. (*Sir William Savory*.) But he does not say there when the child suffered from ulceration of the cornea previously to small-pox?—He says she had suffered from it previously to the attack of small-pox.

16,631. She might have had ulceration of the cornea before she was attacked, and also have had ulceration of the cornea when she was attacked, and the statement of the doctor would have been perfectly correct?—As I understand this letter it means that the child was suffering from ulceration of the cornea at the time.

16,632. When she had small-pox?—Yes, and for some considerable time before.

16,633. (*Chairman*.) Does not it show that she had recovered from that attack?—I do not think so. I have read the letter; I do not know anything beyond what it states, and the information I have previously given to the Commission.

16,634. (*Dr. Collins*.) I understand the medical man to state that the actual condition of the eyes was better than it had been previously?—It is better now and has been since the attack of small-pox.

16,635. What was the date of the first information you received from him?—The first information I received was when the report for 1888 was published. Soon after its publication a discussion was held in the Sanitary Committee, of which Dr. Lakin is a member, and he took strong exception to the statements made in this report—this would be early in 1889.

16,636. Did he state at the time, that is to say, early in 1889, that the condition of the eyes then was better than the condition of the eyes before the attack of small-pox?—I am not sure as to that, but he made similar statements to those contained in the letter.

16,637. (*Sir William Savory*.) But the question is the imputation upon this statement of the doctor at the hospital, that is the point: it is not a question whether the eyes were better afterwards than they were before, but the question is whether the doctor at the



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hospital had made a wrong statement in speaking of the eyes being ulcerated at the time the patient had the small-pox?—I think I stated on the last occasion that Dr. Tomkins might not know at the time he made this statement that the child had suffered from ulceration of the cornea before, but any one reading this book would infer that the ulceration of the cornea was the result of an attack of small-pox.

16,638. So it might have been for anything the letter says?—But if the child was subject to this—

16,639. A child subject to a certain condition would be likely to fall into that state on an attack of small-pox?—The inference therefore would be that the “inflammation of the eyes with ulceration of the cornea” was the result of the attack of small-pox. I can only say from my reading of the letter that it seems an unfair inference to draw.

16,640. How does it bear upon the fact that the child should be better now? Supposing the ulceration had been consequent upon the small-pox, the child might still have been better afterwards?—If the Commission wish, I will make further inquiries, but, as I understand, the child was suffering from ulceration of the cornea at the very time when she was taken ill with the small-pox. My point is, that in my opinion no such reflections respecting the child's health would have been made had the child been vaccinated.

16,641. There is no statement of the fact that she was suffering from ulceration of the cornea at the time of the attack?—That, I understand, is nevertheless the fact.

16,642. (*Dr. Collins.*) There is no statement, is there, to show that there was no disease of the eyes prior to the attack of small-pox?—Not any, on the contrary, the doctor states in his letter she had suffered from ulceration of the cornea before the attack of small-pox.

16,643. (*Chairman.*) There is nothing to show that the person who made the statement knew that she was suffering from the disease before?—So I stated to the Commission last week; but seeing that there are 21 cases referred to in the report of the Medical Officer of Health, and those who are said to be unvaccinated are selected as being the worst victims of small-pox, it is only right that that matter should be cleared up.

16,644. What is your next point?—There are several questions I have here which were left over from last week which I wished to refer to, and with which I will now proceed to deal. There were a series of questions put to me by Sir William Savory, Questions 16,396 to 16,400; one by Sir Charles Dalrymple, Question 16,401; and Mr. Picton also referred to the same subject at Question 16,413, all in reference to the question whether the vaccinations performed by the Medical Officer of Health at the Fever Hospital upon persons placed in quarantine, were successful vaccinations or simply the performance of the operation. I have inquired of the Medical Officer; he has the list of operations which were performed by himself while the patients were in quarantine, and he states that of the six primary vaccinations, all were successful; of the six re-vaccinations two were unsuccessful; one he cannot trace as to whether it was successful or otherwise, and another a child of five years, which had been vaccinated in infancy, had four good scars, and the re-vaccination in this case he describes as being partially successful. Lastly, he informs me that the last seven persons who were quarantined, aged from 18 to 44, had all been vaccinated in their infancy; but as they had all been exposed to small-pox more than a week before coming into quarantine it was he considered too late to re-vaccinate them. This clears up the points raised by all those questions. I now wish to allude to a series of questions addressed to me by Mr. Dugdale, Questions 16,556 to 16,582, as to the application of our system of quarantine to London and places larger than Leicester. I have thought the matter over since last week, and I can see no difficulty whatever in applying the Leicester method to larger places. The system of registration and of vaccination, of rate collecting and sanitary measures in general, are all carried out by the mapping out of districts allotted to each official department. The principles upon which the lines of demarcation are laid down are no different in London from what they are in Leicester and other large towns. We have streets in Leicester, and even houses, which are in two different parishes or unions, and no doubt the same thing would occur in London. It seems to me

there would be no great difficulty in carrying the system out anywhere.

16,645. (*Mr. Dugdale.*) I suppose the size of London would make it considerably more difficult?—It would increase the work, but I do not know that it would increase the difficulty.

16,646. As regards the suburbs of London, have you considered that question?—They would be dealt with exactly the same as the suburbs of other large towns.

16,647. You can scarcely compare London with any other town in England?—I admit there is a greater difficulty by reason of the larger population and area, but it does not appear to me to be an insuperable difficulty, as it would only require a larger staff proportionate to the population.

16,648. The difficulty will be greater, according as you are, or are not, able to persuade all persons who have been in contact with an infected case to go into quarantine?—That is the only difficulty which has arisen in Leicester, but it has been successfully dealt with.

16,649. I understood you to say on the last occasion that there had been cases in which persons would not go into quarantine?—There have only been about 20 refusals in all during a period of 16 years, and these cases were all noted and visited daily until the danger was passed.

16,650. Of course the greater the number of those instances, the more would be the risk of somebody escaping who had the seeds of disease in him and so spreading the disease?—I do not see how that could arise under our system of notification and supervision if properly carried out.

16,651. Pardon me; the larger number of persons who had been in contact with an infected case, and who would not go into quarantine, the more the chances would be that someone would escape to spread the disease?—But it depends upon the moment when the infection or contagion arises. The system pursued at Leicester in a case of that kind is this: where a person has refused to go into quarantine, the sanitary inspector has visited the establishment or house daily for 14 days to ascertain whether the disease has incubated or not. In several instances at large establishments persons have appeared to become infected and have been taken ill before the expiration of the 14 days. They have then consented to go into quarantine, although small-pox has not always afterwards developed.

16,652. Do not you think that the risks would be much greater with a large population like that of London than with a smaller and more manageable population like that of Leicester?—I think the population of Leicester is large enough to prove the practicability of an experiment of this kind.

16,653. But you cannot compare a population of 130,000 or 140,000 with the population of London?—The population of Leicester with the suburbs is something like 180,000; and I cannot see that if the districts of London were mapped out as I have suggested any very great difficulty would arise.

16,654. (*Dr. Collins.*) Are you aware that the Metropolitan Asylums Board in their reports take credit for the immunity of London from small-pox as owing to the method of notification and removal which they adopt?—Yes, and I believe they attach very great importance to that, probably more than they do to vaccination. At least it would appear so from the extracts you read from the reports.

16,655. (*Professor Michael Foster.*) You told the Commission that a certain number of cases were not vaccinated because it was thought it was too late to vaccinate them?—Yes; that was the observation of the Medical Officer of Health. In his opinion it was too late to re-vaccinate them.

16,656. Does that apply only to one or two or to the whole number who are not given as vaccinated for that same reason?—I have only the information which is supplied to me by the Medical Officer of Health.

16,657. Then it is quite possible that a large number of those who were not vaccinated were not vaccinated because in the opinion of the medical authority it would have been too late?—We have no right to assume there was a large number when the Medical Officer only definitely mentions seven. However, I do not know how that affects the question.



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16,658. It affects the question in this way. From the statement which you have laid before the Commission, one would have taken it that a very large number of persons were not vaccinated, leaving the impression that it was not necessary for them to be vaccinated or that they refused to be vaccinated. Now it appears that at all events a certain proportion were not vaccinated because in the opinion of the Medical Officer it was too late. It is possible that a very considerable number of those who were not vaccinated were not vaccinated for a similar reason; if it had not been too late, they might all have been vaccinated; in which case this statement you brought before us as to the large number not vaccinated would not have been made?—I am unable to see any point in the question since there is no basis for such a supposition.

16,659. The question you raised was whether it was true that people were vaccinated in quarantine. Was not the first part of the whole of your evidence at our last meeting intended to show that that was not true—that a large number of people in quarantine were not vaccinated?—Undoubtedly.

16,660. Now it appears that at all events a certain number of them were not vaccinated because it was too late. No one would wish a useless operation to be performed?—But that was the Medical Officer's own observation that only seven were left on this account.

16,661. (Mr. Bright.) Your point was, I think, that they were not forcibly vaccinated?—Yes; those who submitted to the operation were not forcibly vaccinated.

16,662. (Dr. Collins.) Although it may have been deemed too late to vaccinate them to protect them from small-pox, do I understand that only a very small proportion of them subsequently developed small-pox?—Only a very small proportion indeed.

16,663. (Sir William Savory.) By "those who were not vaccinated" you mean those who were not vaccinated at the time?—Yes, not vaccinated while in quarantine.

16,664. But they might have been vaccinated previously?—Yes, and I gave the exact number of those who had been previously vaccinated.

16,665. (Dr. Collins.) A number of them were adults?—Yes, a number of them were adults. In connexion with the question just raised, I should like to refer to the report of the Medical Officer of Health for 1886, page 10. I have already read this paragraph at Question 16,383: "The one case met with was in the person of an artizan, who came into the town seeking work, and who evidently had brought the disease either from Sheffield or Nottingham, he having been in those towns some 12 or 14 days before. The usual prompt measures were adopted, the patient was removed to the small-pox wards, and two other persons who had been in contact with him were subjected to 14 days' quarantine and were re-vaccinated, both of whom escaped the disease; the room he had occupied was thoroughly disinfected, and the bedding he had slept on destroyed. No other case occurred." In reference to those men who were both vaccinated, if they had developed the disease I have no doubt the Medical Officer would have said that the vaccination was done too late; but on reading this, we are led to infer that they escaped the disease through being vaccinated. Coupling this with the remark I have read from the letter Dr. Lakin addressed to me yesterday, it is clear that if they had developed small-pox the Medical Officer would have said in this report that they developed it because the vaccination took place too late.

16,666. (Professor Michael Foster.) Was that the same Medical Officer?—Yes, it was the same Medical Officer who alluded to the ulceration of the cornea in the eyes of the child suffering from small-pox.

16,667. He therefore would have a high opinion as to the necessity of vaccination?—Yes.

16,668. Evidently he thought there was some use in vaccination?—Undoubtedly, he is a strong believer in vaccination.

16,669. (Chairman.) Does that conclude all you have to say with regard to the evidence given last week?—There was a question put to me by Professor Foster on the 3rd of June, Question 16,305. A question was raised as to the accuracy of the table I put in showing the importations of small-pox. He stated: "This is not exact, and it leaves one in the condition of not knowing how great your error is, except that it will

"not be so great as to attract public attention." I cannot see that there is any error at all; no actual error was pointed out.

16,670. (Professor Michael Foster.) But surely the point was that you put into the table given on your Diagram D. a certain number of cases near Leicester, but not in Leicester and did not bring any evidence to the effect that those cases were all the cases which had occurred in the neighbourhood of Leicester upon the area from which you derived your results?—But surely it does not necessarily follow that there is any positive error in the table, on that assumption.

16,671. (Chairman.) That is a matter of discussion and consideration?—But it states in the question put to me that it is an error. I think it should rather have been put to me as "possible error."

(Professor Michael Foster.) I should have said "may be" instead of "is."

16,672. (Chairman.) What is your next point?—I wish now to refer to some questions which were put to me by Sir James Paget. At Question 16,489 I was referred by Sir James Paget to Wolverhampton as being no worse off than Leicester in regard to small-pox, but I find at page 396 of the report of the Royal Commission on Infectious Hospitals, of which I believe Sir James Paget was a member, that Wolverhampton has a small-pox isolation hospital.

16,673. (Sir James Paget.) I referred to the system of quarantine. I suppose most large towns have hospitals in which they can isolate small-pox patients?—I understood you to say that Wolverhampton relied upon vaccination alone.

16,674. Vaccination as compared with quarantine?—But quarantine is only a part of our method.

16,675. I did not say that it was the whole of it?—Reference was also made to Norwich at Questions 16,501 and 16,502. Now at page 83 of the same report it appears that Norwich had compulsory notification as far back as 1880.

16,676. The question is whether any town which does not follow the Leicester system is as free from small-pox as Leicester itself; and all those that I named are so?—But they have some adjuncts to vaccination, to which they always resort when vaccination fails to keep small-pox away.

16,677. There is no doubt of that, but they do not follow what you yourself have frequently called the Leicester system?—That may be so. But we believe in these sanitary adjuncts rather than in vaccination.

16,678. (Dr. Collins.) Is the question you are now referring to Question 16,505, where Sir James says, "and those other towns are not protected by isolation;" to which your answer is, "I do not know that we are protected by isolation; we only regard it as a safeguard in case an epidemic breaks out." Do I understand you now to be suggesting that at any rate Wolverhampton and Norwich, amongst other towns, have some means or other by way of notification or isolation hospitals which would operate in the same direction as the Leicester system would operate?—Yes. They adopt some part of our system in addition to vaccination.

16,679. (Sir James Paget.) But the argument of yourself has been that the Leicester system is that which protects Leicester. My question was, are there not other towns not under the Leicester system which have had as small a mortality from small-pox as Leicester itself?—There are some others, but still these other towns use some part of the method that we adopt, and so derive a proportionate benefit therefrom.

16,680. (Chairman.) You do not admit that any part of your method is useless, I suppose?—No, I do not.

16,681. The point put to you is, that those towns which at all events have not adopted an important part of your method, have suffered no more than you. That was the point put to you, I understand, and that would be so, would it not?—Yes. But it does not follow that those towns have been as liable to small-pox as Leicester, and few of them, if any, rely upon vaccination alone.

16,682. I am not dealing with what inferences are to be drawn from it or what it proves, but that is so, as a matter of fact, is it not?—Yes, that is so. We should, however, regard it as a still greater safeguard if the whole of our precautions were carried out.

16,683. (Dr. Collins.) I understand that if the claim be advanced that such immunity as those other towns



have is the result of vaccination alone, that would be incorrect to the extent to which they adopt isolation?—Yes, it is unfair to claim for vaccination that which may be accomplished by other means.

16,684. (*Sir James Paget.*) That claim has never been advanced?—I understood that that was the claim advanced.

16,685. (*Dr. Collins.*) I was alluding to Question 16,504, in which it is put to you that “people ascribe their immunity to the practice of vaccination”?—Besides Wolverhampton and Norwich, Sir James Paget cited a number of towns which had a very small death-rate from small-pox, but I find that in Keighley Union there have only been four deaths from small-pox since 1875, and this is an anti-vaccination centre; while Sheffield gives us 739 small-pox deaths for the same period; and there is an enormous number, amounting to more than ten thousands in London, yet both of those places are well vaccinated.

16,686. (*Chairman.*) What is the population of the Keighley Union, do you know?—I believe there are about 70,000 in the Union. I should like, in connexion with the subject of small-pox, to read a quotation from the “Lancet” of June the 13th, 1891.

16,687. Is it a statement of fact or views?—It is advice given to the London authorities.

16,688. (*Chairman.*) I think we must exercise our own intelligence without the aid of the “Lancet”?—I should like at least to say, then, that the “Lancet” urges upon the authorities the exercise of great sanitary precautions, in view of a possible renewed outbreak of small-pox in November next; and the only regret it has to make is in regard to the indifferent method in which vaccination is being carried out at the present time.

16,689. What is the next head you desire to lay before the Commission?—I should like now to refer to the question which was left over from a previous meeting as to the number of vaccinations. I have had this sheet prepared by Mr. Chamberlain showing the manner in which the calculations were carried out. On the right-hand side in red figures you will find the difference between the present table he has given me and the one that he put in originally.

16,690. Taking the vaccinations for the year 1867, he gives the number of births as 3,498, and the vaccinations for the year ending September the 30th as 1,445. Now are those public vaccinations only?—Those are public vaccinations only for the year ending September, and the births for the same period are 3,511. The births you have quoted 3,498, must, I think, be for the year ending with December.

16,691. Are those all the public vaccinations for the year ending September 30th, 1867, without reference to the time when the persons vaccinated were born?—They are taken from the Public Vaccinators’ returns; therefore, I think that would be so.

16,692. That would be all the public vaccinations, without reference to when the children were born?—Yes, I think it would.

16,693. It would not represent the number born in that year, but the number vaccinated?—It could not represent the number born in that year, it would be the number of public vaccinations within the year.

16,694. That is in the year 1867, public vaccinations. Then I see in that year he gives 18 private vaccinations, making a total of 1,450. Do you know how that 18 is arrived at or how the 1,450 is arrived at?—That 18 is the difference between the 1,432 and the 1,450.

16,694a. But do you know how the 18 is arrived at?—Your Lordship is now dealing with the December tables, and not with those for September. Mr. Chamberlain arrived at the 18 in this way: the whole of the vaccinations were taken from the registers, beginning with the births registered 1st January and those ending with the 31st December, and that number was found to be 1,450. Then the public vaccinations after adjustment for the December totals, come to 1,432, which are deducted from the 1,450, the difference showing the private vaccinations as 18.

16,695. The 18 is derived by deducting 1,432 from 1,450, which is taken as being the total of those whose names appear in the vaccination register from the 1st January to the 31st December 1867?—Yes.

16,696. The Secretary tells me that he has gone carefully through it and that the total is only 1,250 and not 1,450?—By the figures we abstracted from the same

books we got 1,450, 839 for the east district and 611 for the west. I do not know whether Mr. Ince has taken exactly the same dates as we have, but I believe he is aware that there are about 300 vaccinations in the register which have not been referred back to the previous birth entries.

16,697. The result of that would be that instead of having only 18 for private vaccinations, which looks like a strange figure, you would have a large minus quantity which looks like something erroneous in making up the number of vaccinations?—Yes, omitting the “deferred” entries, but with these the numbers practically agree, making more than 1,450.

16,698. So do Mr. Ince’s if you are speaking of entries which have not been referred back to the birth entries, but they have been left out in both, and the only question is whether the figure is 1,450 or 1,250. Have you any details showing how the 1,450 is made up?—Yes, I have the details here and the registers they are taken from.

16,699. Are you sure that in some years you have not counted in the entries of vaccinations which have not been referred back to the birth entries?—When that question was put to me before, I was under the impression from what the Vaccination Officer had told me they were not included, but I now find that some of the entries have been made in the middle of the register, and that those had been called out to me by the Vaccination Officer, although he omitted some at the end of the registers.

16,700. Take the register, numbered 31, for West Leicester in the early part of the year 1867, you make 225 vaccinated and 259 unvaccinated, which would make 484, whereas the Secretary finds upon the register 424, which is a difference of 60, and then in the columns showing the cases which have not been referred back to the birth entries there are just 60, which would account for that difference; but I understood you to say just now when we were discussing the matter that if those were added it would have made your 1,450 up to 1,550?—Not having copies of the private papers from which your Lordship is now quoting I am unable to follow the details, but when the 60 are included, it appears there is no difference between the totals. The numbers of “deferred” entries which probably require adding to the Secretary’s 1,250, according to his examination of the registers, is 333, making 1,583 as against my 1,550.

16,701. But have they sometimes been added in and sometimes not?—There are a few at the end of the registers which have not been added in.

16,702. I thought you said that the 1,450 was arrived at without adding any of those in?—I did not intend to convey that impression only in regard to those at the end of the registers. I suppose that from 1873 to 1889 no exception whatever is taken to the distribution of the figures as they stand.

16,703. No, only what occurs to me is that in the year 1867, for example, you have 1,432 as the number of cases vaccinated by the Public Vaccinator; those were all cases he vaccinated without reference to the year in which the children were born; then in order to add to that the number vaccinated by private practitioners you take the total number of vaccinations attributable to the births of that year and you deduct from that total the 1,432, and you assume that the residue was the number vaccinated by private practitioners?—Yes. Your Lordship is now quoting from Mr. Chamberlain’s Table A, and that is how he deals with it.

16,704. But then you are dealing with two totally distinct sets of figures arrived at in a different way. I cannot see how deducting the 1,432 from the total of 1,450 (even supposing the 1,450 to be right) could give you even approximately the number vaccinated by private practitioners, because they are figures founded upon a totally different basis. Your 1,432 are vaccinations by Public Vaccinators in that year, but your 1,450 are not the vaccinations in that year at all, they are the vaccinations of children born in that year whenever they were vaccinated, some of them not being vaccinated till two or three years after. How can one of those totals deducted from the other give you, even approximately, the number of private vaccinations; they have no relation to one another?—It might not for that one year only, but for a series of years the figures would rectify one another. I have looked at this matter from a great many points of view and I find that whatever method you adopt in dealing with the vacci-

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nations there is some underlying fallacy, owing to the different official systems of district returns and registration; and I do not know that any greater fallacy underlies the mode in which Mr. Chamberlain has dealt with the figures here, than would underlie any other mode that we could adopt. You have before you the detailed abstracts which have been made from the register for 1867.

16,705. That at once accounts for this apparent anomaly which we could not understand, namely, how there could be only 18 vaccinations by private practitioners in a single year in Leicester at a time when the population was being largely vaccinated. One sees that that does not obviously represent the facts?—The “being largely vaccinated” does not particularly apply to that year, 1867. I may repeat that I make no separate use of either public or private vaccinations after putting them upon the first diagram; I use the totals only.

16,706. But the totals are not correct?—In what way may I ask, are they incorrect.

16,707. Because if you have 1,432 public vaccinations in the year 1867 it is a certainty almost that you would have a great deal more than 18 people vaccinated by private practitioners in that year, and that therefore your total of 1,450 is too small, because your total of 1,450 is a different thing?—I was rather surprised at the smallness of the number, and I pointed it out to Mr. Chamberlain, but he remarked that the total of 1,450 was all that he could get from the register.

16,708. But your total of 1,450 is a total of vaccinations of children born in 1867 whenever they were vaccinated. Your 1,432 is the total of children vaccinated by the Public Vaccinators whenever they were born, which are two totally different things; and you cannot by taking the difference between the one thing and the other arrive at the amount of private vaccinations?—But I make no use whatever of the private vaccinations; I only make use of the totals.

16,709. Then let us understand what your total is. Anybody seeing this would say that in the year 1867 there were 1,432 public vaccinations and 18 were private vaccinations, making a total of 1,450; that is obviously wrong, is it not?—The total number of vaccinations is right, according to the registers, but the apportionment between public and private for the births may be incorrect for that particular year, but spread over the long series of years we are dealing with these apparent anomalies are rectified by one year compensating for another.

16,710. Your total at all events of 1,450 (we will leave out the question of public or private) represents the vaccinations of children born in that year whenever they were vaccinated, so far as they have been registered under that year?—Yes, and the same principle applies also from the year 1873 to the present time. Under a different system of distribution that figure might be modified.

16,711. Yes. I am only taking one year as a sample?—My object in using these figures, as I have done, was to place the distribution of the figures for the years before 1868 upon the same footing as those since 1873. In other words, I was anxious, as far as possible, to place the vaccinations throughout upon one consistent basis of distribution.

16,712. But do not you think it conveys an extremely false idea, when you colour on your Diagram A, as you do, the amount of vaccinations in the year 1871, which I think is the highest column that is arrived at, when in truth of your total for 1871, of 3,736 something like a third of the actual vaccinations took place in 1872?—Not when it is understood that this principle applies to all the years alike. But whether the idea be true or false it is based upon the usual mode of distribution, and there is no official system you can adopt, that I know of, by which you can get them more accurately.

16,713. I am not saying there is, I only want to know the facts. It seems to me that it would convey, and it did convey to me at first, a very different idea. I thought that those represented the vaccinations in the year, and I do not at the present moment see why it would be impossible to arrive at the vaccinations in the year, as distinguished from the vaccinations of children born in that year, which did not take place in some cases for a year or two afterwards?—There is no doubt that the only strictly accurate way of gauging the vaccinal condition of a community is to obtain the actual

number of vaccinations performed within any given year, irrespective of age. I asked Mr. Chamberlain if these could be obtained, and at that time he told me he did not think they could. He assured me that all the vaccination figures were from official sources, and that from 1872, even if not from 1868, they had all been previously sent to the Local Government Board. I tested some of the years, and compared the results with the annual per-centage calculations of the Local Government Board, and as I found the figures agreed, I relied upon the information. I am using those figures therefore in just the same way (if I may give such an illustration) as Dr. Buchanan would use them if he came before the Commission.

16,714. I should have thought that you would have desired to get the statements connected with your figures and your figures themselves as accurately as possible?—That is my desire, and has been all along.

16,715. Because you want to draw certain inferences from them, if you leave them subject to attack as to their accuracy and are comparing two things which do not compare anyone would have thought he had demolished your figures if he showed this. I thought I was assisting you by pointing out that your figures did not warrant the inference that you drew from them?—I accept that assistance readily. If the whole of the vaccinations shown on Diagram A. had been coloured pink, not taking any notice of public or private vaccinations separately, the same result would have been attained that I desired to attain. I have prepared the details of distribution for some later years, and I find that the same thing occurs even after 1872; for of the total number of births registered in 1873, 872 were vaccinated in 1874, but as this kind of thing occurs year by year, the figures compensate for one another.

16,716. But you have got your total by adding on to the public vaccinations one fifth of the private vaccinations, and you obtained that one fifth by taking the proportion which the public bore to the private vaccinations in later years. I am now pointing out to you that that basis is an unsound one, because one of the years you have taken for an average is the year when you put down the private vaccinations as only 18, when obviously there is no reason to suppose they were only 18. If that is incorrect, then the basis upon which you get your earlier years is incorrect, and all these years are incorrect?—Yes, that might be so if any special argument were based upon this particular year alone. It does not, however, necessarily follow, because there is another year (1864) which is nearly as much above the average as that year is below it, and as a matter of fact that calculation was not based upon the year 1867 alone, but upon a series of years of which that is only one.

16,717. That is so, but that would have a tendency to pull down the average?—But it would, if corrected by a different distribution, have the opposite tendency of raising the figures for the earlier years. There appears to me to be another way of dealing with it different from the one adopted and that is this. From 1853 up to the year 1862 the registers for the east district are in existence, and if those vaccinations were abstracted and a similar proportion added for the west district, which would unquestionably be as fully vaccinated as the east, I do not think that any possible exception could be taken to the figures; it is only another way of calculating it, but I question whether it would be more accurate or bring out more accurate results.

16,718. Am I to take it now that throughout your calculations you have added to the entries of those vaccinated referred to the year, the entries of those vaccinated in the year which have not been referred back to the birth entries?—Not all of them.

16,719. Would you tell the Commission to what extent you have done that?—I am unable to say exactly, because the vaccinations were read out to me from the registers by the Vaccination Officer, and unless I examine them for myself I could not tell to what extent this has occurred.

16,720. I ask you that, because I have looked at another book, and I have no doubt that that accounts for the discrepancy between the total arrived at by the Secretary and by you; because, taking the next book, the register numbered 32 for West Leicester, you have 164 vaccinated and 301 unvaccinated, which makes 465. The Secretary makes it 407, 115 vaccinated and 292 unvaccinated, but then he finds that there are 68 entries of vaccinations not referred back to the births, and that



number added to the 407 makes it 475. It ought to be uniform, I do not say which would be the proper way, but either they ought to be all included or they ought to be all excluded?—At the time you were questioning me on this subject before, I was under the impression they were all excluded, because, at the end of the book the Vaccination Officer did not read some of them over, and that is borne out by the figures your Lordship has just quoted, as the difference of 10 proves, that the Secretary has abstracted a few more than we have. It is also further borne out by the fact that in the figures the Secretary has abstracted he gets for the five years 1867–1871 about 150 more vaccinations than we did. These he has taken from the same registers, and that justifies the statement I made before that some were omitted. However, I find now, what I was not then aware of, that a number of the “deferred” entries are entered in the middle of the register. But still they were primary vaccinations and the vaccinations of children, and if we substituted the words “primary vaccination” for “vaccinations to births” it seems to me that the difficulty would be got over.

16,721. But still if done at all it should be done uniformly?—Yes. It should be done uniformly, and I will do it so for the Commission.

16,722. Some of these deferred vaccinations would be those of persons over 20 years old, would they not?—I should think not many, but if they were primary vaccinations I do not see how that would matter.

16,723. But would they be certainly primary vaccinations?—There might be a few re-vaccinations included in the public returns for the earlier years, but certainly not very many.

16,724. (*Dr. Collins.*) I gather from the heading of your Diagram A. that the red represents the public and private vaccinations for each year of births, so far as they can be ascertained from public and official sources?—Yes.

16,725. Having heard the criticisms which have been passed upon it, do you adhere to the accuracy of that heading?—Yes, the heading is accurate from the year 1868, and I do not think it is far from accurate in respect even to the earlier years. If it deviate at all it would be, as I have before remarked, in the figures being somewhat below the actual numbers. I might here revert to a promise I made the Commission that I would get the number of re-vaccinations. I have been able to obtain a list of them from 1873. From 1873 to 1877 there were six; from 1878 to 1882 there were seven; from 1883 to 1887 there were 50; and in the years 1888 and 1889 there were 24.

16,726. (*Chairman.*) By Public Vaccinators?—Yes, re-vaccinations by Public Vaccinators.

16,727. Of re-vaccinations by private practitioners there is no record?—No; no record at all. Mr. Chamberlain states it as his opinion that there would not be a larger proportion than those I have just read, even for the years 1849 to 1867. It is, therefore, altogether an inappreciable number; it does not affect the general result.

16,728. Taking the year 1864, the figures given on your Diagram A. seems to have been arrived at in a different way?—Yes, that is a special year.

16,729. The total number of vaccinations actually performed during the year ending the 29th September 1864 by Public Vaccinators was 5,853, but it is said that, according to the registers for that year, 1,925 persons, whose births were registered in the year ending the 31st of December 1864 were vaccinated at some time?—But I thought the registrar only gave 1,283 as public vaccinations.

16,730. No; the way Mr. Chamberlain has done it is this: the register, it is said, shows that 1,925 persons whose births were registered in 1864 were vaccinated at some time; then if you take one third of this number, as representing private vaccination, it leaves what Mr. Chamberlain calls the normal number of public vaccinations for the year at 1,283. He says, “If we take a third off for private vaccination.” But why should that year be dealt with separately?—I think there must be some inaccuracy in the way he has dealt with 1864, and I will look into it. It is, however, altogether an exceptional year.

16,731. I suppose it is because if you dealt with it according to the number vaccinated your public vaccinations would have exceeded your total?—It would, because the registered public and private vaccinations

are enormously exceeded for this year by the public vaccinations alone as given by the medical returns.

16,732. (*Dr. Collins.*) It would show a larger number of vaccinations for that year than there were births?—Yes; a much larger number.

16,733. (*Chairman.*) Ought not those to come in somewhere?—The “extra vaccinations” do come in in the quinquennial diagrams; but it scarcely seemed right to put the whole of those on one year; it would be absurd to confine them to a single year.

16,734. But Mr. Chamberlain puts the number of public vaccinations approximately at 1,200 for the year; that would be 4,600 additional. Do you suppose that those were registered back to the earlier years?—I do not think they were referred back, and the number 4,600 which your Lordship suggests will probably prove to be nearer the actual number of “extra vaccinations” than the 3,928 given by the registrar. We take account of them in the quinquennial periods, and we make a note of them in the annual diagrams.

16,735. How do you take a note of them?—There is a foot-note to the tables referring to them.

16,736. Was there anything to show out of that large number how much was re-vaccination in the year 1864?—Not for the year 1864; there is nothing to show that.

16,737. As you have drawn your Diagram A., and with that heading you ought to exclude surely all those vaccinations which took place in the year which did not relate to the births in that year; those ought to be excluded, ought they not, because it must be one thing or the other—it will not do to mix up two things—the vaccinations of children born in the year whenever vaccinated with the vaccinations of children in the year whenever born. You must either have one system or the other?—As I have already told the Commission, I tried to obtain the information to distinguish them, as your Lordship suggests. But it was not for me to formulate a system of registration. I had to deal with what I found in existence. If we could separate them I should like to do so; but the information given me by Mr. Chamberlain was exactly as I put it upon this chart.

16,738. But there is no difficulty in separating them?—My information was to the effect that it could not be done; but if I can get the necessary data I shall be glad to do so. The diagram might then perhaps require another explanatory note adding for the year up to 1867.

16,739. But since 1867?—Since 1867 it would be perfectly accurate.

16,740. What would be perfectly accurate?—The statement made on the diagram; under any circumstances it would be strictly accurate from the year 1872, because it is in harmony with the official figures already presented to the Guardians, and subsequently forwarded to the Local Government Board, and to impugn one you must impugn the other.

16,741. I do not know that, because in 1868 you make your total 3,179, whereas the Secretary makes it 2,705, which I expect results from the same thing; that you have included vaccinations which have not been referred back to the birth entries?—I daresay we have most of them, but not all.

16,742. That ought to be corrected, ought it not, because you see your total of 3,179, professes to represent the vaccinations of children born in the year, but it does not, because you have added on to it the vaccinations of children not born in that year?—Some few would be added, but one year rectifies another.

16,743. There would be apparently something over 400 children not born in that year; that would be 15 per cent.?—Possibly there would be, but I take a period sufficiently wide to rectify any fluctuations that may arise. From the year 1872, the heading would be absolutely accurate, and I was given to understand that up to that time the same conditions prevailed with respect to the vaccination registers, and I felt bound to act upon the official figures and information supplied to me.

16,744. I observe that you have opposite the year 1883, the total public vaccinations as 1,732; it would appear from the Local Government Board's return that that number should be 1,967, how do you account for that?—That is easily explained. The number 1,732, was printed in the return ordered by the Guardians, before the subsequent supplementary return giving 1,967, was sent to the Local Government Board; and that figure has evidently been carried forward in the subsequent printed returns presented to the Guardians without correction.

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16,745. But the larger figure would properly represent the number upon the basis upon which you have constructed your tables?—Yes; only the difference between the two numbers would represent the number of children vaccinated after the 30th June 1884, up to the beginning of February 1885, when the final supplementary return would be sent to the Local Government Board.

16,746. But those are included in the previous year?—Yes, the final supplementary returns are all included in the previous years.

16,747. Then in 1885, instead of your number 1,376, the number, according to the Local Government Board return, is 1,481; I suppose the same explanation would apply to that?—Yes, a similar explanation applies.

16,748. For the year 1886 the 598 should be 655?—Yes. The 598 was the number on the first supplemental return, and the 655 was on the final one.

16,749. And for 1887 the 322 should be 343?—Yes, on the same principle.

16,750. And for 1888 the 219 should be 220?—Yes.

16,751. And for 1889 the 126 should be 127?—Yes, and the explanation is that the return for the Guardians is usually printed in August and the returns from which you are now reading are not prepared for the Local Government Board until the following February; so that it is obvious that they could not be included. These Guardians' returns are printed year by year by order of the Board, and instead of correcting them up, the clerk to the Guardians has carried on the figures which had been printed the year before. He did not inform me of this fact when supplying me with the figures.

16,752. What is the next point with regard to vaccination that you wish to say anything upon?—I wish to state that I have made a number of calculations from the census returns for the east and the west districts of Leicester to obtain the proper relation of one to the other of the births and vaccinations. I have also calculated the number of vaccinations according to the payments that have been made for them, and it seems to me that it might meet the view of your Lordship thus to ascertain the actual number of vaccinations irrespective of age that have been performed within each year. I have no doubt that this plan would meet your Lordship's views, but even then there might possibly be some payments for vaccinations done in the previous year. There must be some assumption underlying it, whichever way taken, and I should, of course, be departing from the usual official way of using the figures. But if we take it all through, assuming that the same proportion would be carried over from year to year we should arrive at as true a result as possible; indeed, I believe the figures as they stand are not very far out. I should like also to read to the Commission the result of our investigation into three other years, and then you will see that almost the same per-centage of "deferred vaccinations" applies to them as the per-centage to which you have already referred. Of the births in 1873 there were 2,759 vaccinated in that year; in 1874 there were 872 vaccinated.

16,753. (*Dr. Collins.*) Of the births of the year 1873?—Yes, there were 872 of those births vaccinated in 1874; in 1875 there were 17; in 1876 there were two; in 1877 there were two; in 1879 there were two; and in 1881 there was one. Just the same thing applies to 1876. Of the births of that year there were 2,504 vaccinated within the year, and 1,107 born in 1876 were vaccinated in 1877; there were 27 in 1878, eight in 1879, two in 1880, four in 1881, one in 1882, one in 1883, and one in 1890. Then in 1880 out of the births for that year there were 1,804 vaccinated in 1880, 1,096 in 1881, 67 in 1882, six in 1883, one in 1885, and two in 1886, so that the general teaching of these figures is this: that on the approach of or during an epidemic and its subsidence, the vaccinations of births within the year attain a higher proportion than they do after the epidemic has passed away. You see that in 1880 we have returned to almost the same conditions as in 1867, before the epidemic.

16,754. The children are vaccinated younger in epidemic years?—Yes, a greater proportion are vaccinated younger in epidemic years. The figures I have quoted in the previous answer go to prove that the apparent anomalies in the vaccination figures, which have been so frequently referred to, are not occasional but general, prevailing more or less in all years alike; but this is

owing to the system of registration rather than the fault of any individual official. The only redeeming feature is that one year compensates for another. In whatever way you take them there are certain to be some fallacies underlying the calculations, but they are only such as would apply to any other mode of dealing with the same thing. I have endeavoured to get the vaccinations all, as I thought, upon the same basis, to make them consistent throughout, beginning with the year 1849 and ending with 1889.

16,755. (*Chairman.*) What strikes me as calculated to mislead any one who did not go into it deeply, is the division of your total vaccinations into public and private, because your totals are taken from statistics which may be taken as meaning one thing, and your public and private vaccinations are taken from statistics which may be taken as something quite different. It is not really a division of the same thing as your total?—If you take up the printed table of which you have a copy, and cast up the total number vaccinated by Public Vaccinators and deduct that number from the grand total of vaccinations for 30 or 40 years, it gives you the number vaccinated by private practitioners. But taking a single year the division might not be exactly accurate, although the total number would come out correct, and this applies all the way through. I do not know that it applies any more to the earlier years than it does to the later years. I have spent an enormous amount of time in trying to find out some better way of dealing with these figures, but the only one I can ascertain is the one I have suggested.

16,756. I do not see the use of your supposed division into public and private when it does not really represent the fact?—It is the nearest approximation to fact that that the official system of registration allows us to make. But I afterwards make no use of it at all by way of argument. I take the total numbers only. It is a matter of perfect indifference to me whether they are private or public.

16,757. The only thing is that it does create an error in the earlier part, because you arrive at your total by an addition to which I cannot agree?—A possibility of error, perhaps, not necessarily actual error. But even that addition, made to account for a few missing registers, is, I think, more than justified; because it is rather below than above the exact proportion for other years. Had I not made some such addition I should have laid myself open to adverse criticism for omitting some of the private vaccinations. Will your Lordship consent to the registers being returned for the years I have named, so that I may test for myself whether there is any inaccuracy in them or in Mr. Chamberlain's figures?

16,758. For what years?—Beginning with the first register from, I think, 1853, on to the year 1862.

16,759. I do not see that there is any objection to their being returned, but we shall want them back?—Yes, they can be returned when we have examined them. Resuming now the statistical part of my evidence, and taking the vaccination figures subject to any revision which may come from a further examination of those registers, the next point I wish to deal with is the small-pox mortality of Leicester taken in quinquennial periods from the year 1838 to 1889. Dividing the 52 years into groups of five years each, we have ten quinquennials and one period of two years only, namely, 1888 and 1889. I will now hand in Table 11, which gives in the several columns—first, the periods of years; secondly, the average annual death-rate from small-pox per million population in quinquennial groups of years; thirdly, the vaccinations of each period; and fourthly, the average annual vaccinations to 1,000 births; and also Diagram E., which illustrates the table, and shows, firstly, the mean annual small-pox deaths per million population in successive quinquennial periods from 1838 to 1889; secondly, a great rise in small-pox mortality, coincident not only with the more stringent enforcement of vaccination, but also with the consequent accumulation from 1849 of its alleged protective power; and thirdly, the general abandonment of vaccination by the Leicester people, when small-pox mortality rapidly disappears. (*The table and diagram were handed in.* See Appendix III., Table 11, page 435, and Diagram E., facing page 435). Before vaccination was largely practised the highest average annual death-rate was 679 per million in 1843-47. This high mortality had been forced up by the terrible epidemic of 1845. Immediately afterwards when vaccination was introduced and began to be more fully practised, the



slight decline to 522 per million in the third period 1848-52, and then to 91 per million in the fourth period 1853-57, was of course attributed to vaccination. But if small-pox was controlled and reduced as was then alleged by the comparatively speaking small amount of vaccination, which then prevailed, is it not extremely singular that, as vaccination still went on increasing our mortality from small-pox also increased in each succeeding period to 1868-72? The average annual rate of small-pox deaths rose from 91 per million in the fourth period to 175 per million in the fifth, and from 175 per million in the fifth to 316 in the sixth. During all this time the alleged protective power of vaccination was increasing. With still further increased vaccination the small-pox death-rate per million rose from 316 in the sixth period to the unprecedented total of 773 deaths per million per annum in the seventh period 1868-72, these being the very years when the practice of vaccination most extensively prevailed; and when, according to the pro-vaccinist theory we ought to have had least small-pox, we had the most. Since this fatal vaccination period the practice has rapidly declined, and small-pox mortality after falling to 15, 13, and 4 per million in the eighth, ninth, and tenth periods respectively, has now with the general abandonment of vaccination entirely disappeared. The average small-pox death-rate for the whole of these 11 periods is 289 per million. This average is exceeded in three periods after the introduction of vaccination; in 1848-52 by 233 per million; in 1863-67 by 27 per million; and in 1868-72, our highest vaccination period, the average small-pox death-rate is exceeded by the enormous number of 484 deaths per million per annum. I should like now to compare the power of vaccination and the power of sanitation in controlling small-pox.

16,760. Before you go to that, I want to ascertain whether I understand your figures. Your average annual small-pox deaths per million are attained by taking the total small-pox deaths in the quinquennium, and distributing them over the five years?—Yes, distributing them equally over the five years, and taking the population for the middle year of each period.

16,761. Taking what the death-rate from small-pox, supposing it to have taken place in each of the five years equally, would have been?—Yes. I have added together the number of deaths for each of the five years, and divided them by five to obtain the average, before making the calculations for the death-rate.

16,762. (*Dr. Collins.*) Upon the population of the middle year?—Yes, upon the population of the middle year. Of course there are several ways in which the rate can be calculated, but I believe that this is the mode adopted by the Registrar-General.

16,763. (*Chairman.*) Then your total calculations for the five years are arrived at by adding up the totals you have given us in the table at the foot of your Diagram A. ?—Yes.

16,764. The average annual vaccinations per 1,000 births are those arrived at by taking the number of vaccinations in the quinquennium and distributing them equally over the five years, and applying that again to the average birth-rate or the birth-rate of the middle year?—To the average annual birth-rate, not to the births for the middle year. The birth-rates vary, so that the same method of calculation would not apply to them as to the population. I was about to observe that the effect of vaccination as compared with the power of sanitation in controlling small-pox can be more clearly seen if we omit the first two periods on Diagram E., and take only the periods since the introduction and fuller practice of vaccination from 1849. The whole of the sanitary works which have been carried out in Leicester, date from about 1849, and therefore correspond in order of date with vaccination. To make the comparison I have just alluded to, I have prepared Table 12 and Diagram F., which I will now hand in. (*The table and diagram were handed in. See Appendix III., Table 12, page 435, and Diagram F., facing page 435.*) Table 12 gives in respective columns: firstly, the five year periods; secondly, the number of small-pox deaths in each of the periods; thirdly, the average annual small-pox death-rate per million; fourthly, the total vaccinations for each period; fifthly, the average annual vaccinations per 25,000 population; and sixthly, the average annual number of sanitary orders issued for the abatement of nuisances. Diagram F. illustrates Table 12 and gives the average annual small-pox death-rate per million in black columns. The vaccinations on the population basis are shown by the blue curve. Three per cent. only

of the total vaccinations of each five-year period is denoted by the red curve. Ten per cent. of the average annual number of sanitary orders to abate nuisances is shown by a brown curve. Diagram F. shows, firstly, the average annual small-pox death-rate per million population in successive quinquennia since the earliest obtainable complete year of registered vaccinations (1849); secondly, after more than 20 years of continuous vaccination, a great increase of small-pox mortality, which culminates in the unprecedented fatality of 1868-72, when vaccination also reached its highest point. Thirdly, subsequent to 1872, a rapid decline in vaccination is shown until it was practically abandoned, and an equally marked increase in sanitation, &c., when small-pox mortality also rapidly declines and becomes extinct. Very little real sanitary work appears to have been done in the earlier periods shown by this table and diagram. Notices were issued in a perfunctory manner, but no regular and methodical inspection and supervision such as we have now was carried out. Although it is difficult to show accurately the exact sanitary work accomplished, we are able to some extent to ascertain its advances, and the number of sanitary orders issued year by year supplies perhaps the most reliable index as to the amount of work accomplished.

16,765. The large number of sanitary orders may represent that things had been neglected and got into a bad condition, may it not? It does not necessarily show that active steps had been taken to make things continuously better?—I think it does show that active steps were being taken to effect permanent improvement; and the improved health of the town shows that was so.

16,766. A sanitary order directs you to do certain things, to carry out sanitary improvements?—Yes, to effect improvements and also to abate nuisances.

16,767. If you have a large number of sanitary orders it may prove that people are neglectful and create a large number of nuisances which require to be abated?—There is no doubt that by neglect they created a large number of nuisances in the past.

16,768. But I mean in the present. From 1878 to 1882 I had been led to suppose that you were tolerably active in Leicester, and yet there were only 1,882 orders per annum, whereas in recent years I understand there have been 8,000?—Yes, but in the earlier years they were, comparatively speaking, solely to abate nuisances, whereas now they are to carry out sanitary improvements such as the removal to the outside of the premises of soil, and other waste pipes liable to cause infection.

16,769. (*Dr. Collins.*) Am I right in assuming that the Public Health Act of 1875 operated in the direction of making it much easier to press for the abatement of nuisances?—There is no doubt that it did so, by conferring greatly increased powers on sanitary authorities.

16,770. (*Chairman.*) But the quinquennium from 1868-1872 was much less progressive from your standard than the quinquennium from 1873 to 1877?—The cause of the greater number of sanitary orders in the latter period was unquestionably the epidemic of 1871-1873; the impulse of the increased activity observed by the sanitary authority had not expended itself until 1877. There was, however, a temporary lull afterwards, but even then the sanitary orders show greater official activity than before the epidemic.

16,771. From 1878 to 1882 you only give them as about 1,800 on the average, whereas from 1883 to 1887 there are 6,500; was there any great change between those two quinquennia?—I know nothing to account for that great rise, except a determination on the part of the sanitary authority to place Leicester in a foremost position as regards sanitation.

16,772. (*Mr. Bright.*) The alterations which are brought about through these orders are permanent alterations and improvements, are they not?—They are permanent alterations and improvements, much more so now than they were years ago.

16,773. (*Chairman.*) They are not all permanent alterations and improvements?—No, but I say they are to a much larger extent than they were years ago.

16,774. (*Mr. Bright.*) You would say when a large number of these orders were carried out that there was to that extent a permanent improvement of the sanitary condition of Leicester?—Exactly, that would be so.

16,775. Those orders are generally for the removal of ash-pits, and establishing a system for the removal

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of night soil?—Yes, and the abolition of privies, and in some cases the closing of wells where the water supply was impure, and works of that description for the permanent improvement of property.

16,776. Can you tell me whether they have adopted in Leicester the Rochdale system of night soil removal?—The Rochdale system is only partly in operation, it was introduced some years ago on account of the sewers being inadequate; it was thought undesirable to throw a greater amount of work upon the sewers until their capacity had been increased.

16,777. But there is a tendency, I suppose, in Leicester to do away with cesspools and what are called ash-pit middens, and that sort of thing, and adopting the practice of the Rochdale system?—The ash-pit middens are now nearly all abolished. I have the exact numbers. In 1873, with a population of 100,741, inhabiting 22,000 houses, there were 6,000 privies in Leicester and 3,500 middens, or wet ash-pits; there were 500 pails on the Rochdale system, 5,000 water-closets, and 4,000 dry ash-pits. In 1888, there were only 200 privies, but the waterclosets had increased to 15,000; these would represent the results of a large number of those sanitary orders shown on Diagram F.; the pails had increased to 6,500, and very few of the old wet refuse receptacles remained. The Rochdale pail system is not favourably regarded, as it is thought to be a probable means of conveying infection. The Leicester sanitary authority intend therefore to gradually abolish these pails as the new sewers are completed.

16,778. (*Mr. Picton.*) At the time when these orders began to be issued so energetically, have you any reason to think that Leicester was worse than other towns in a sanitary point of view?—I do not think it was, but it might have been; it has always been worse off than other large towns from its geographical position, it is exceedingly difficult to get any good drainage. The flow of the river Soar is so sluggish, and the general contour of the land so flat that until recently, they were unable to find a free outfall for the sewers at all, and now an artificial one is being constructed.

16,779. (*Dr. Collins.*) Do back-to-back houses exist to a large extent in Leicester?—Not to the extent they do in Leeds and other northern towns. We have a great number of them, but there is generally a considerable space between the houses.

16,780. I do not know whether there are more of them or fewer than in Yorkshire, where the practice largely existed of building back-to-back houses?—I should say that we have considerably fewer of them in Leicester than exist in Yorkshire.

16,781. (*Sir James Paget.*) Has there been in Leicester any great diminution in the mortality from other epidemics since the improved measures of sanitation have been adopted?—There has been a very great diminution in the death-rate from zymotic causes generally.

16,782. Could you put in a statement as to that?—I propose following this statement with statistics relating to the zymotic diseases. I thought it best to keep them separate. Resuming my statement, I go on to show that after 1852 there is a regular advance in the small-pox mortality noticeable and culminating in 1872, and moving upward concurrently with an irregular rise in vaccinations. The progress of sanitation as represented by the sanitary orders, advanced but slightly until forced upward by the overwhelming alarm occasioned by the small-pox epidemic of 1871-72. Taking the first period in which we have reliable information as to the sanitary orders, the rise in the number of small-pox deaths is from 29 in the second period to 359 in the fifth.

16,783. (*Chairman.*) What is the 29?—That is the total number of small-pox deaths for the period 1853-57, rising from 29 to 359 in the fifth period; while the death-rate from small-pox rises from 91 to 773 per million.

16,784. In your Table 5 you have given the death-rate in each year from small-pox. Is the result arrived at, working upon Table 5, by adding the yearly rates together and dividing them by the number of years that you take?—No, it is arrived at by taking the total number of small-pox deaths for the five years, and dividing it by five, then calculating the death-rate upon the population for the middle year of the period. The result would come out slightly different if I took it in the way you suggest. The middle population of any

five years is always slightly below a fifth of the populations of the five years added together, supposing that the increase is regularly progressive.

16,785. Would it make the number appear larger?—The variations in the average annual death-rate would depend upon where the epidemic fell in the five-year period. If it fell in the earlier part of the five-year period it would bring out a different result from an epidemic falling in the last year. If you took an epidemic in the first year of a period upon that annual system of calculation you would find a much higher rate of mortality than if the epidemic occurred in the last year of the five, so that adding together the death-rates for each of the five years and dividing this total by five, you obtain a much higher result through the epidemic occurring in the first year than if it fell in the fifth. Again resuming; the accumulated vaccinations rise from 9,540 in the second period, 1853-57, to 17,728 in the fifth period, 1868-72. Sanitary orders advanced from an annual average of 397 to 1,133 for the same periods. On examining the registers I find that the annual sanitary orders were as follows: in 1868 there were 455, in 1869 there were 388, and even in 1870 they had only risen to 495. At this time the small-pox epidemic was already in possession of many centres of population in the country, and our Local Board, after considerable pressure, began to awaken to a sense of their duties. The sanitary staff was increased, and the erection of the wood and iron buildings which have continued to do duty as a fever hospital ever since, was pushed on with so as to be ready to receive the expected small-pox patients from the town, which we had been told over and over again was well protected from small-pox. The effect of these special efforts raised the sanitary orders in 1871 to 2,241, and in 1872 to 2,085, so that less benefit than might have been expected, considering the number put down for that quinquennial period, was derived from the increase of these sanitary orders to the annual average of 1,133. They were carried out too late, because neglect had reigned too long for these tardy measures to influence that epidemic. Following on, we get a fall in small-pox deaths from 359 in the fifth period to 9 in the sixth, 8 in the seventh period, 3 in the eighth, and 0 in the ninth period. The fall in the death-rates corresponding was from 773 per million in the fifth period to 17 in the sixth; then to 13 in the seventh, then to 4 in the eighth, and lastly, to 0 in the ninth period. Meanwhile vaccinations decline from 17,728 (after a rise in the sixth period) to 7,156 in the last complete quinquennium, the eighth, and to only 486 for the last two years of the ninth period. But a corresponding advance took place in sanitary work. The orders rise from an average annual number of 1,133 in the fifth period to an average annual of 8,137 in the ninth.

16,786. (*Sir James Paget.*) Can you trace any proportion between the diminution of vaccination and the fall in the mortality of small-pox?—The fall is not mathematically proportionate; the fall in the number of deaths from small-pox is more rapid than the fall in the number of vaccinations, but they both go in the same general direction.

16,787. The diminution in the period of five years following your period does not bear a proportion, I think, to the increase of the sanitary orders or the diminution of vaccination; it seems to be coincident but not proportionate?—It may not be absolutely proportionate. But I take it that this would apply to small-pox epidemics everywhere, nor could we expect an erratic disease like small-pox to exhibit such a proportion anywhere, even in pre-vaccination periods.

16,788. Then we could not ascribe the diminution of small-pox either to the increase of sanitation or the abolition of vaccination?—Perhaps not the whole of the enormous drop which immediately succeeds the epidemic, most of the fuel, so to speak, having been burnt up.

16,789. (*Mr. Bright.*) Was the Leicester system of isolation, and so on, introduced directly after the epidemic, or was it begun during the time of the epidemic?—It was not introduced until late in 1877, upon the importation of some small-pox cases into the town, as is shown upon Diagram D, which I have put in.

16,790. (*Mr. Picton.*) I did not understand you to admit in answer to Sir James Paget that the progress of sanitation had nothing to do with the decrease of small-pox?—No, I did not say that. I simply say that the fall in small-pox mortality was disproportionately



great immediately after the epidemic as compared with the fall of vaccinations. But coupling that fall with the great advance of sanitation I maintain we have two important factors which go a very long way towards accounting for our subsequent freedom from the ravages of small-pox.

16,791. (*Chairman.*) But there had been, had there not, if you take the three quinquennia from 1863 onwards, a very great amount of vaccination in Leicester during those three quinquennia?—Yes; and in the fourth and fifth periods a very great amount indeed, quite sufficient, one would have thought, had there been any virtue in vaccination, to have prevented the epidemic of 1872.

16,792. Although there was some diminution in the next quinquennium, that diminution would only operate as regards the children born during that next quinquennium; you might have, that is to say, taking the quinquennium from 1878 to 1882, considering deaths and births, a considerably larger vaccinated population than you had at any previous time?—As a matter of fact we had not, because the vaccinations had declined considerably.

16,793. Taking the amount, which again declined from 1878 to 1882, may not the population in the years from 1878 to 1882 have been on the whole more largely vaccinated than at any previous time?—That might possibly be the case, but I do not think it is so. The true answer to this question depends upon the length of time the "protection" is supposed to last, and also upon the question whether a population may be considered "vaccinated" after the assumed period of "protection" has expired. I propose putting in some tables subsequently to show what the effect of vaccination has been in that direction. Resuming my evidence I was about to observe that it is sometimes alleged by medical men that vaccination alone has the power to control small-pox, and that sanitary measures have no effect whatever in lessening its fatality. If there be any truth in this assertion, Leicester is now almost altogether "unprotected." There is little vaccination; and according to the assumption to which I have just alluded, our sanitary condition is of no avail to protect us from small-pox. Following up this idea, if with 95 per cent. of vaccination in 1872 we lost 346 lives by small-pox, which is equal to a death-rate of 3,523 per million, with our increased population when an epidemic threatened us in 1888 through the importations of small-pox from well-vaccinated Sheffield, assuming the per-centage of vaccinations to be the same, we ought, to have lost 517 lives, that is, to equal the fatality of the epidemic of 1872, or a death-rate of about 5,263 per million.

16,794. Was not the epidemic of 1871, 1872, and 1873 more severe generally than any epidemic there has been ever since your tables began?—It was unquestionably so, and it is significant that it occurred at a time when vaccination had been just previously practised more largely than at any other period.

16,795. I am not upon the point of the extent of vaccination, but I understand you to assume that if small-pox came and you were unprotected by vaccination it would follow that you ought to have proportionately as great a number of deaths as you had in 1872?—What I stated was that if the per-centage of vaccinations had remained the same as in 1872, and if we had suffered a similar epidemic in 1880 when an epidemic certainly was threatened, by the large number of importations, the number of small-pox deaths should have risen to 517, but instead of this we had none. Vaccinations having meanwhile declined from about 86 per cent. to only about 5 per cent.

16,796. But was there any epidemic anywhere in England in 1888 compared with that which prevailed in 1871 and 1872?—There was the Sheffield epidemic, which notwithstanding vaccination caused a great amount of uneasiness and terror; and there was also a great deal of small-pox in many large towns of the country.

16,797. (*Sir James Paget.*) How many cases were imported from Sheffield; did you not return two?—There were two importations from Sheffield, and three from other places, but we had 21 small-pox cases in that year, and similar epidemic conditions existed then to those which existed at the commencement of the epidemic in 1871-72, which might have resulted in widespread fatality but for the prompt application of our Leicester system.

16,798. (*Chairman.*) But surely the more general an epidemic is, and therefore the more generally it is prevailing, seeing that almost every town is in communication with different parts of the country, the more sources there are from which it is likely to be imported?—There is no doubt of that, but at this time they had small-pox at Cardiff, Barton Regis, Birdwell, Birmingham, Bedminster, Blackburn, Bristol, Broomhill, Heanor, London, Londonderry, Manchester, Mansfield, Northampton, Perth—

16,799. What year are you speaking of?—I am speaking of the latter end of the year 1887, and the beginning of the year 1888.

16,800. But it was not comparable to the epidemic of 1872?—It was not comparable in extent to the epidemic of 1872, excepting probably at Sheffield, where it was widespread and very severe.

16,801. (*Mr. Meadows White.*) What year was it that you stated on the last occasion was like 1872?—The year 1887. At Questions 16,585 to 16,589 I think you asked me as to the existence of epidemic conditions similar to those existing in 1872 at Leicester and elsewhere. I have looked up this information and I find that small-pox was in existence in all the towns I have named. At Perth (where four revaccinated hospital nurses were attacked) Portsmouth, Stapleton, Sheffield (where it was severely epidemic), South Yorkshire, and Warwickshire, and other places; so that no one can deny that epidemic conditions did prevail to a very large extent in 1887.

16,802. (*Chairman.*) At Sheffield it was no doubt severely epidemic, at other places there was small-pox, but in London there were only seven deaths from small-pox in 1887, so that it could not have been severe; in Manchester there were only six; in Portsmouth there were only three; at Cardiff eleven; and at Bristol thirteen: except in Sheffield it was not seriously epidemic anywhere, was it, in that year?—Not perhaps except in Sheffield; there was, however, a serious outbreak at Preston. But the places you have just mentioned are well-vaccinated towns, yet, as you say, they have a total of about 40 deaths from small-pox, and apparently very little stir made about it; whereas if we had only had but one or two small-pox deaths in Leicester, there would doubtless have been sensational paragraphs, as before, in the newspapers, causing a commotion and exciting prejudice against us all over the country.

16,803. (*Mr. Meadows White.*) Is that what you meant by your answer to me, the presence of small-pox at those places?—Yes. I also wish to explain in further answer to Mr. Meadows White that at this time conditions existed in Leicester such as existed at the commencement of the epidemic of 1872, and when Dr. Barry was before the Commission, I noticed that in answer to Question 2540 in the Commission's Second Report he states that the first two cases of small-pox in Sheffield were both mild cases in vaccinated persons, but in his opinion they gave rise to the epidemic, so that if the existence of those two cases grew up into an epidemic in Sheffield we had more than those conditions prevailing in Leicester at that time, with much less vaccination and no subsequent epidemic.

16,804. That is what you meant by the conditions of an epidemic being the same, that there were two or three cases which might have spread the disease possibly if they had not been dealt with?—Yes; more than two or three, I think you might say several cases.

16,805. (*Dr. Collins.*) I think you said it was 21 cases that you had?—There were 10 cases at the latter end of 1887, and 21 at the beginning of 1888, making a total of 31 centres of infection.

16,806. (*Mr. Meadows White.*) Were they all at the same time?—They followed within a few months; probably the whole of the 31 cases occurred within a period of six months.

16,807. (*Mr. Bright.*) There was an epidemic in 1882, was there not, a general epidemic?—I think London suffered principally from that epidemic the chief force of which was felt in 1881.

16,808. I know that there was an epidemic in Rochdale at the time; I do not know whether it was general throughout the country?—We had more small-pox cases in 1882 than occurred in any other year since 1873. In further reply to Mr. Meadows White I quoted in answer to Mr. Dugdale's Question 16,448, the opinion of our medical officer, Dr. Tomkins, as bearing out this statement respecting Sheffield, that if our system had



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been in existence there they need not have been suffering from the epidemic of 1887-88, which he confesses had got beyond all control.

16,809. That is Dr. Tomkin's opinion?—Yes. You will find it at page 15 of his report for 1887. Then in another part of the Report of this Commission in regard to the security derived from primary vaccination Dr. Gayton, at Questions 1770 and 1772, in reply to Mr. Picton, says that "primary vaccination would not ward off an epidemic," and that "until you do get compulsory vaccination you can never hope to stamp out epidemics of small-pox." I should like also to refer to a statement made by Dr. Buchanan in the report upon the epidemic of small-pox at Sheffield, he says at the bottom of page xv.: "In the borough, among people of all ages, there has been enough omission for the enumerators to have reckoned two per cent. of unvaccinated persons," and he goes on to say, "This two per cent. of the population claims to be regarded as so many 17th or 18th century people scattered about Sheffield, for the very purpose of having themselves compared, under 19th century conditions of life, with the law-abiding people of the present period." If, according to the statement of Dr. Buchanan, this two per cent. was a sufficient amount of inflammable material to give rise to such an epidemic of small-pox as that at Sheffield, I submit that under no conceivable Act that could possibly pass through Parliament, would a greater number than 98 per cent. of vaccinations ever be obtained. Sheffield is admitted to be a well vaccinated town; and whatever little risk may be alleged against our Leicester system, a still greater risk is run by a system of vaccination which allows only two per cent. unvaccinated to be so dangerous to the community as is represented by Dr. Buchanan.

16,810. (*Chairman.*) Does that cover all you have to say with reference to sanitation in connexion with small-pox?—That is all at present.

16,811. What is the next point?—The next point I wish to refer to is the question of the vaccinal condition of the community, a question that was raised by your Lordship some time ago. I wish to direct the attention of the Commission to the general vaccinal condition of the people of Leicester, and for this purpose I give the per-centage of vaccinations to the total births, and also the per-centage of vaccinations to births after deducting the dead unvaccinated, and the accumulated vaccinations for five years. I will now hand in the table. (*The table was handed in. See Appendix III., Table 13, page 436.*) This table shows that the highest average per-centage of vaccinations ranged over the five years preceding and including the epidemic year itself. The accumulated "protection" was also much higher in 1872 than in any preceding year.

16,812. The total vaccinations for five years are the totals upon your Diagram A. added together?—Yes, practically so, with the additions on the further tables, I have promised to prepare for the Commission.

16,813. And your per-centage of vaccinations is to births living?—It is calculated from the total number of births given upon the first table.

16,814. (*Mr. Meadows White.*) Those are vaccinations in the year in which the births are registered?—Yes; they are the vaccinations for the year in which the births are registered.

16,815. (*Chairman.*) The per-centage of vaccinations to births is taken by adding up the births for each year?—No; it is taken upon the actual number of births registered in each year.

16,816. I do not follow this table. The first column is small-pox deaths per million; that one understands. Let us take the year 1862: "Per-centage of vaccinations to total births"; you take the totals in that year from the totals that I see upon Diagram A.?—Yes, the actual numbers.

16,817. Then you take the total of vaccinations?—Yes.

16,818. You calculate the one from the other?—Yes, on a per-centage basis.

16,819. Then "Per-centage of vaccinations to births living"; how do you get that?—I deduct the number of children who die before vaccination age, and who are returned as dead unvaccinated, and then I calculate the number of vaccinations upon the actual number of children remaining alive.

16,820. The dead in that year?—Yes, the dead unvaccinated in each year.

16,821. What do you get that from?—It is presented in the returns which are periodically sent to the Local Government Board. I explained that from 1868 they represent the children who had died before the notices of the Vaccination Officer were served upon the parents; and you will find a footnote to this effect on Diagram A.

16,822. Then "Vaccinations for five years"; that is adding the vaccinations for the four previous years and that one?—Yes, five with the current year included. Grouping these facts in five-year periods we have a clearer view of their relative effect, as is seen in my next table, which I will now hand in. (*The table was handed in. See Appendix III., Table 14, page 436.*) The highest average annual per-centage of vaccinations, 91.74 on total births and about 100 per cent. on the births living, after deducting the dead unvaccinated, corresponds with the highest average annual death-rate from small-pox, 773 per million in period VII. Vaccinations fall in the next period to a per-centage of 80 on total births and small-pox deaths to 17 per million.

16,823. It is quite consistent with that, is it not, that the vaccinated population was smaller in the quinquennium from 1863 to 1867 than in that from 1868 to 1872?—Do you mean proportionately?

16,824. No, actually. Your vaccinations during any quinquennium affect only the addition to the population remaining alive at the end of the five years born in that quinquennium. That is a very small proportion to the total?—That is shown in the last column, which does show a higher total accumulation for the latter five years.

16,825. There are no doubt more of the population born, unvaccinated in that quinquennium than there were of the population born in the preceding quinquennium; but it is consistent with that, is it not, that there may have been a total larger vaccinated population for Leicester during that last period?—I show that it is so in the last column.

16,826. Taking the periods VIII. and IX. the number vaccinated is less in the latter quinquennium, but still the total number of vaccinated persons alive in the town may have been greater, may it not?—Without having regard to the length of time they had been vaccinated it would necessarily be greater.

16,827. (*Mr. Picton.*) The proportion of the unvaccinated was greater?—The proportion of the unvaccinated was also greater, although the total number of vaccinated was increasing if you do not take into consideration the time that had elapsed, and the duration of "protection." That point just depends upon the protective power claimed for vaccination, and the length of the period the protection is supposed to last.

16,828. (*Chairman.*) There would have been a considerable proportion of the population unvaccinated?—Yes, and a greater proportion as compared with some earlier periods.

16,829. (*Dr. Collins.*) Comparing the unvaccinated population in the latter period with the unvaccinated population in the former period, am I right in saying that in the latter period the average age of the unvaccinated would be probably much lower than the average age of the unvaccinated in the earlier period?—It would be very much lower: showing a growing dislike of the practice. Proceeding with my statement I affirm that with the per-centage of vaccinations to total births at 66.67 small-pox deaths fall to 13 per million; and when vaccinations fall to 29.87 per cent. the small-pox death-rate is only 4 per million. Finally the vaccinations fall to 5 per cent., and there are no small-pox deaths to record.

Adjourned till Wednesday next at 1 o'clock.



## Seventieth Day.

Wednesday, 24th June 1891.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
 Sir W. GUYER HUNTER, K.C.M.Q., M.P.  
 Sir EDWIN HENRY GALSWORTHY.  
 Sir WILLIAM SAVORY, Bart.  
 Dr. JOHN SYER BRISTOWE.  
 Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
 Mr. J. ALLANSON PICTON, M.P.  
 Mr. SAMUEL WHITBREAD, M.P.  
 Mr. F. MEADOWS WHITE, Q.C.  
 Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

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16,830. (*Chairman*.) You were dealing on the last occasion with the proportion of the vaccinated to the unvaccinated population at different periods?—Yes. To further illustrate that subject I will now hand in Table 15. (*The table was handed in. See Appendix III., Table 15, page 437.*)

16,831. Will you explain how that table is compiled?—Table 15 gives in quinquennial periods the number assumed to be “protected” and “unprotected.” This table must be considered side by side with Table 14, and unless the claim is put in for life-long protection by a primary vaccination it will show the utterly baseless character of assumptions so often made that the population is vaccinated and therefore “protected” up to 90 or 95 per cent. This table (Table 15) gives the number of persons registered as vaccinated in quinquennial periods from 1849 to 1889, with the complement of the population for consecutive life ages. In this table the whole of our population is accounted for in each period, no deduction having been made for deaths of vaccinated or unvaccinated, their respective numbers being made up by the growth of population. On the assumption that vaccination “protects” for five years only, column 3 gives the number alleged to be “protected” at the close of each five-year period, with the balance of population left “unprotected.” Column 4 gives the same for 10 years, and column 5 for 15 years.”

16,832. Beginning with your first item, the four years ending 1852, the population in the last year of that period, which you have taken throughout as determining the population for the purpose of your table, was 61,467?—Yes. I have taken the population for the last year of each period.

16,833. You there insert out of that number as protected, assuming the protection lasts for five years, 5,782, and as unprotected 55,685?—Yes.

16,834. How is the 5,782 arrived at?—They are the registered vaccinations for the four years ending 1852.

16,835. And you assume all unprotected who were not vaccinated in those four years?—Yes, taking five years’ “protection” as the limit.

16,836. But do you mean when you put down the number of unprotected that they were the number unprotected in the last year of the four years?—Yes. There would be some vaccinations before 1849, but as we can get no definite records of them this table starts with 1849 as the first year of complete official records.

16,837. In that first year the figure would not be accurate, even assuming the protection to be lasting for five years only?—There is the first year deficient, and I did not feel justified in making any assumption to make up the deficiency.

16,838. That would make a considerable difference, would it not?—Yes; it might make about a fifth difference, but it would not be quite a fifth

because there would not be the population in 1848 (the omitted year) that there was in 1852. The numbers in this table have been revised from the table which you have now before you.

16,839. The private vaccinations are still matter of estimate?—Yes, they are for the first few years, but it is an estimate more than justified by ascertained facts.

16,840. You have done the same from 1853?—Precisely the same for each of the periods, assuming vaccination was a protection from small-pox. Of course it is necessary to know what limit is assigned to its “protective” power, but I know of no ultimate authority for appeal upon that point. Very few medical men will now affirm, as Jenner did, that it protects for life; and the varying durations of protection are almost as numerous as the opinions of medical men themselves. Some affirm that it only protects for one year, others for five, ten, fifteen, and some advise vaccination or re-vaccination whenever an epidemic of small-pox occurs. In my judgment every re-vaccination implies a distrust of the previous operation.

16,841. But there are some who regard the protective power as existing for very much longer periods, are there not; that is to say, as modifying the character of the disease or rendering it to some extent less likely that the disease will be contracted?—Some may consider it modifies the disease for a longer period than 15 years, but it is exceedingly difficult to get any definite opinion upon the subject. Now, in Table 15, assuming that vaccination lasts in full force for five years, in the quinquennium from 1868 to 1872 only 181 out of every hundred of the population would be “protected.” Extending the “protection” to 10 years, we have just over 30 out of every hundred, and extending it to 15 years, we get 38.9 supposed to be protected from the disease out of every hundred of our population.

16,842. In taking those figures have you still excluded what you call the extra-vaccinations; there are 3,000 of them in one year; are they excluded from your table because they were not referable to the year?—No; as I have said before, they are included in all quinquennial tables and diagrams so that they would be included in this Table 15.

16,843. But they are not upon your Diagram A.?—No, they are not shown in colour upon my Diagram A., but they are mentioned in a foot-note at the bottom of that diagram.

16,844. But they are included in this table?—They are included in this table. The numbers for these percentages of five years’ “protection,” for the period from 1868 to 1872, are much higher than those that prevail in Leicester at the present time, or indeed for any other period of five years’ “protection.” Our present five years’ “protection,” that is, taking the year 1889 as the last of the five, gives us only 2.8 out of



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every hundred of the population "protected" for five years; and if we may allow for 16 years' protection, we get only ten "protected" out of every hundred of the population, and for 15 years' protection there are only 21·3 out of every hundred of the population for whom any claim of "protection" can be made.

16,845. (*Professor Michael Foster.*) Do those figures contain re-vaccinations as well as vaccinations?—No; they do not contain re-vaccinations unless any should happen to be included before 1867.

16,846. (*Chairman.*) In some years there is reason to believe that there has been considerable re-vaccination, as, for example, during the epidemic of 1871-72?—There might have been, but, if so, it is not shown here.

16,847. If there were re-vaccinations this table would show less protection than really existed?—Yes, assuming that a large number had been recently re-vaccinated, but any such assumption must of necessity be largely speculative.

16,848. Is it not pretty certain that a considerable number would have been re-vaccinated during the currency of an epidemic, especially in the years 1871 and 1872, when the objections to vaccination were not so strong in Leicester as present?—There are always some during epidemics. It is impossible to tell the exact number so we can only deal with the primary vaccinations alone. In the memorandum on vaccination, prepared by the Local Government Board, issued to Boards of Guardians in March 1888, it is stated: "The protection against small-pox conferred by vaccination in infancy becomes diminished as age advances, and the protection against attack appears to more rapidly diminish than the protection against death by the disease. Even before puberty a portion of the original protection is often lost, and this is particularly the case when the vaccination in infancy has been incomplete, having produced one vesicle instead of several, small vesicles instead of large." The statement is further made that "a properly performed re-vaccination gives a second measure of protection at least equal to the first. Whether the protective influence of this second vaccination becomes impaired, and if so under what conditions, is not known." In a leaflet, which accompanied that memorandum issued to Boards of Guardians it is also stated that "Parliament has provided the means for vaccination being everywhere properly done. When it is so done, there need be no apprehension that vaccination will injure health or communicate any disease." It goes on to say, "These are the words of the Select Committee of the House of Commons in 1871, and they are as true to-day as when they were written." I may say that I fully agree with the latter statement, and I think my table partly meets the questions which your Lordship addressed to me at Questions 16,823 to 16,826.

16,848a. The question I put to you had relation to the proportion of vaccinated to unvaccinated, but your table is based upon the assumption that vaccination protects either for five or ten or fifteen years?—I quite understand your Lordship.

16,849. (*Professor Michael Foster.*) Do I understand you to say that this table is put in neglecting re-vaccinations, that is to say, without regard to how many re-vaccinations had taken place?—Entirely, because no reliable records exist which give the number.

16,850. So that the error which may be due to re-vaccinations is unknown?—It is impossible to ascertain the facts with reference to re-vaccination so that no calculation can be based upon such an unknown quantity.

16,851. (*Dr. Bristowe.*) Would it not be better to put to the first column, "Number and per-centage of persons primarily vaccinated during the five years"?—I do not know that it would, if you take into consideration the heading of the table. I think the explanation given at the top of the column is quite sufficient without the alteration suggested.

16,852. (*Chairman.*) No, it is not sufficient without that explanation, because it does not show the number and relative per-centage absolutely, by reason of the leaving out of the re-vaccinated cases?—We have never taken any notice of the re-vaccinations; I think it would be unwise to attempt to do so, because every re-vaccination would be the vaccination of a person already supposed to be "protected" by a primary vaccination; and if the re-vaccination had taken place

within the limit of the periods specified on the table, I should have laid myself open to the accusation of error in the opposite direction by so far doubling the amount of "protection" existing.

16,853. Your not taking notice of them does not prevent the existence of the fact that there had been re-vaccinations, and so far as there had been re-vaccinations it would alter the proportion of the protected to the unprotected?—It might alter it slightly, but only very slightly.

16,854. (*Professor Michael Foster.*) You cannot say how much it would alter it?—I cannot say definitely how much it would alter it; but I am sure it could not alter it very largely.

16,855. (*Mr. Picton.*) You are familiar with the opinions, and have watched the habits of the people of Leicester for a number of years, have you not?—Yes, I have resided there all my life.

16,856. If there were extensive re-vaccination, you would be sure to know of it?—I should be sure to have heard of it, owing to the prominent position I have occupied in the town as an opponent of vaccination for more than 20 years.

16,857. So far as you know, it is not a common practice, is it?—It is not a common practice. I have made numerous inquiries of medical men as to the number of re-vaccinations that they have performed, and I find that they have been extremely few.

16,858. (*Professor Michael Foster.*) Take the year 1872?—In the year 1872, which was altogether an exceptional year, there would no doubt have been a number of private re-vaccinations.

16,859. And public re-vaccinations too?—Yes, there would have been a number of public and private re-vaccinations at that time, but since then they have been very rare indeed.

16,860. (*Dr. Collins.*) If you had desired to correct this table so as to include re-vaccinations, should I be right in saying that such correction must have been speculative and purely an estimate, because of the absence of the registration of the private re-vaccinations?—It would be entirely speculative.

16,861. (*Professor Michael Foster.*) Is not the estimate of the amount of protection entirely speculative as it is if you cannot state what was the number of re-vaccinations?—I believe the question of "protection" is altogether speculative.

16,862. (*Chairman.*) In the return made in October 1871, to the Local Government Board of the public vaccinations performed in Leicester during the year ending the ending the 29th of September 1871, the re-vaccinations appear to be recorded; there were 1,983 primary vaccinations, and there were 390 public re-vaccinations in that year. In 1872 there is no record of the number of re-vaccinations apparently, but there would be likely to be more re-vaccinations in 1872 than in 1871, because in 1872 the epidemic was at its height, whereas in 1871 there were only 12 deaths?—I believe in 1871 a new form was issued to the Poor Law authorities to register the re-vaccinations, but that requirement was omitted in 1872, so that we have not the registered numbers, and naturally where there is so much uncertainty prevailing I thought it best to form no estimate at all.

16,863. I think it will be well at the heading of these tables to state that the re-vaccinations are omitted, as it is impossible to obtain the number of them?—I am quite willing to put a note to that effect to state that they are omitted from the table.

16,864. (*Sir William Savory.*) Your tables show the death-rate from small-pox in Leicester during a number of years before and after 1871-72, do they not?—They do.

16,865. Have you dealt with the question of the distribution of the death-rate according to age?—Yes, I have dealt with that.

16,866. Have you brought it before the Commission?—Not at present, but I purpose doing so; I presume you are referring to what is called the age incidence of small-pox.

16,867. Showing the distribution of the death-rate amongst the different ages before and after 1871-72?—I intend dealing with that in some tables I have been preparing.



16,868. And that is to come?—Yes, that is to come later on. Professor Michael Foster has referred to re-vaccinations as a matter that we should take into consideration, but I should like to point out to the Commission that, even if those suggested additions were made to this table, there are also a very large number of deductions. We should strike out (and this is of course a matter impossible to ascertain accurately) all the “doubtful,” the “bad,” the “imperfect,” and the “poor” vaccinations, also the “indifferent,” the “moderate,” the “imperfectly foveated,” and the “imperfectly performed” vaccinations.

16,869. (*Professor Michael Foster.*) And you have no means of ascertaining how many should be deducted for that reason?—No, because no doubt all these were paid for as successful vaccinations.

16,870. This is a table, then, to which you do not know how many you ought to add, and how many you ought to take away?—I presume that observation would apply to most vaccination tables. There would be some conditions which it is impossible to take into account, especially under the present system of registration.

16,871. (*Mr. Pictou.*) From your knowledge have you reason to believe that the deductions would more than compensate for the possible addition of re-vaccinations?—Certainly far more. We should also have to deduct that “imperfect” vaccination which has been described as “in some ways worse than none at all;” the “scanty” vaccination, the “unsatisfactory,” the “very defective,” the very “inefficient,” and that which is “wanting in essential characters.” We must also deduct that which Dr. Buchanan describes, in the reprinted “Extracts from his Annual Report for 1884, page xv., as “bastard operations,” and that which he further describes as a “form of private vaccination” that offers itself in competition with public vaccination and which parades its inefficiency as a reason for “its acceptance by ignorant people.” In addition to this, we have what is styled “semi-efficient” vaccination and “semi-successful,” and vaccination of a “spurious character.”

16,872. (*Chairman.*) If the theory, I do not say it is so, but if the theory that is put forward with reference to re-vaccination is correct, the re-vaccinations might produce an important effect on these figures, might they not, because they would be cumulative; they would not disappear at the end of five years, because the suggestion is that if you have an adult re-vaccination it protects substantially for the rest of life. Assuming that theory to be correct, then each of these re-vaccinations would have to be added to your periods because they would not disappear at the end of the five or the ten year periods?—They would not disappear on such a hypothesis as that suggested by your Lordship, but I know of no absolutely reliable authority which makes that affirmation. On the basis of my table they would necessarily disappear at the close of the periods stated.

16,873. You do not know any absolutely reliable authority which puts the protection at five, ten, or fifteen years: you have assumed a speculation for the purpose of your figures?—I do not think the figures can be considered speculative; but the periods of “protection” referred to are based upon the opinions of medical men, and unless we are to be guided by the opinions of medical men in regard to belief upon this matter, I do not know what is to guide us.

16,874. That is just what I have been putting to you. We have had the view put before us that in the case of the re-vaccination of an adult the protection is much more durable than the protection from primary vaccination. You may say that that is merely speculation, it is merely speculation in the same sense in which any of these other opinions are speculative?—Precisely the same, but if we must have any speculation at all I prefer to take the instructions of the Local Government Board to Boards of Guardians for the re-vaccination of children over the age of 10 years, and as it states here, “Under circumstances of exceptional danger from small-pox they have authority, if they see fit, to “re-vaccinate applicants over 10 years of age,” so that practically the limit which this official memorandum gives to the “protection” by primary vaccination is 10 years, and as it states that the “protection” afforded by re-vaccination is “the same as that afforded by primary vaccination” you cannot extend it for more than 10 years.

16,875. Will you just read again to the Commission the statement which you say points out that re-vacci-

nation does not confer any longer protection than primary vaccination?—“A properly performed re-vaccination gives a second measure of protection at least equal to the first.” Whether the protective influence of this second vaccination becomes impaired, and, if so, under what conditions is not known.”

16,876. That does not to my mind convey the assertion that the second vaccination does no more than the first would have done. It says it does at least as much, but whether it would not do a great deal more, or how much more, is a matter of uncertainty?—But the memorandum states that the duration of the influence of re-vaccination beyond that of the primary vaccination is “not known,” and it scarcely does to enter into speculative matters with regard to these things. I should suppose that this memorandum issued by the Local Government Board is in their judgment really the outcome of a general consensus of medical opinion.

16,877. All these matters which you call speculative are more or less verified by experience?—Then we must take this as the general outcome of average experience.

16,878. When we are at the end of this inquiry I trust we shall be in a position to give more authoritative statements than even a Local Government Board memorandum. We shall have had more facts brought before us than probably any member of that Board has ever had, and given more time to its consideration?—I sincerely hope you will.

16,879. (*Mr. Bright.*) I take it that your object in bringing this table before the Commission is to show the maximum amount of protection which the compulsory vaccination law has afforded in Leicester, which does not recognise re-vaccination?—Yes, that was my object, because re-vaccination does not come within the scope of the compulsory law.

16,880. This is the protection afforded by the compulsory law to which you object?—It is.

16,881. Which some medical men assume to last five years, some that it lasts 10 years, and some that it lasts 15 years?—Yes, I believe it is purely assumption throughout.

16,882. (*Chairman.*) You do not state that to be the purpose as I understand. I understood your object was to show the proportion at any given time of the protected and the unprotected population in Leicester?—Had it not been for the compulsory law this inquiry would have been unnecessary. But from the proportions given on my table we are able to draw certain deductions, which I hope will be useful. Amongst them we may notice this, that from 1853–57 our small-pox mortality was very low, and at that time the low small-pox mortality was attributed to the protection of vaccination brought about by the Act of 1840, and yet at that time the five years’ protection was only 14·65 out of every 100 of the population. This table also meets this assumption which I referred to at the beginning of my observations, that sometimes a population like that of Sheffield is taken to be vaccinated or “protected” up to the extent of 95 or 98 per cent., while obviously it all depends entirely upon the duration of time which is ascribed to the so-called protective power of vaccination.

16,883. (*Sir William Savory.*) But when you speak of “protection,” what do you mean? Do you mean absolute protection so that the person is incapable of receiving the small-pox?—I simply use the term in the sense in which it is frequently used by medical men. Our Medical Officer of Health, uses the term vaccination, as synonymous with absolute protection.

16,884. But “protection” has often different meanings attached to it; it may mean absolute immunity from small-pox, or that if it is contracted it is considerably modified?—I think it is seldom used as being absolutely a protection, but, if as you suggest, “protection” has such a variety of meanings, its efficiency is undermined and no absolute reliance can be placed upon it.

16,885. No doubt it is used sometimes as being an absolute protection, but I take it that the general belief is that the influence of vaccination does not come to an end suddenly, at the end of five or ten years, but that it affords a greater protection for a certain number of years, and then after that a gradually decreasing protection until it disappears?—Yes, that is a matter of opinion. To say nothing about its power to modify the disease, I have already referred the Commission to a large number of deaths which took place in Leicester

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from small-pox amongst all ages, after vaccination, from one month upwards to a large number of years, showing the inability of vaccination to protect from death by small-pox even at any age.

16,886. But that is a very small amount of evidence in comparison to the whole mass of evidence before the Commission; there is a very large mass of evidence to the contrary?—I am unacquainted with any evidence which contradicts the facts referred to in my tables and diagrams. Dr. Gayton, in answer to Question 1755 as to what value he attached to single vaccination, said, "I think primary vaccination is a very fleeting protection indeed. As to the time the primary vaccination lasts I do not know, but I think it is a very short time."

16,887. (*Chairman.*) But we have all that evidence before us; it is evidence given before this Commission; we shall consider that evidence, we shall not consider it any better because it is repeated. What we are anxious to get from you is any facts you are able to bring before us as to Leicester or vaccination generally. What is the inference to be drawn from these facts is a matter which we shall have to judge of by-and-by; not from any one fact, but from all the facts before the Commission?—Then would you look again to the facts represented by the figures in my Table 15. Whether vaccination protects either for 5, 10 or 15 years, it is an indisputable fact that from 1868 to 1872, we had reached the maximum of the five years' accumulated "protection." Out of every 100 of the population there were according to this table, 18 vaccinated or "protected"; and this figure is not reached in any other quinquennium upon this table now before the Commission. Consequently at the time when, under the five years' protection theory, we were best "protected" we had the heaviest rate of small-pox mortality. If we take the 10 years, or the 15 years, period of "protection," we had reached in 1872 the highest measure of "protection" of any preceding period, and yet in that very year when our aggregate protection is known to be the highest up to date; we experienced the most fatal small-pox epidemic ever known in the history of the borough. Even if we were to extend the period of supposed protection to 20 years or 25 years, taking 1868-72, when our vaccinations of births unaccounted for were only about four or five per cent., the usual assumption would be that we were vaccinated to the extent of 95 per cent. But on the other hand I say, even if we carry on the protection up to 20 years, there would not actually be half the population vaccinated, and even carrying on the period of protection to 25 years there would only be about 53,000 out of our total population of 98,000. Of course the question is when the protection dies out, if there be any "protection" at all; but no one seems to know anything about it. I consider the figures on this table completely expose the fallacies of the statements so often made respecting per-centages of "protection" by vaccination.

16,888. (*Dr. Collins.*) Reverting to the question of the possible permanence of the protection of re-vaccination as compared to the possible impermanence of primary vaccination, I do not know whether your attention has been directed to the Army Medical Department Report for 1888, where, speaking of small-pox mortality in Bengal, it is stated, "The greatest number of cases occurred at Lucknow, 32 with five deaths; it is stated that all the men had been re-vaccinated, and the cases varied from being very mild to severe and confluent"?—My attention has not been directed to that particular record of facts, but I have heard of similar instances of deaths from small-pox following re-vaccination. I do not know whether the Commission has had the following statement put before them; if so I will refrain from reading it. It is a statement made by Dr. Ballard in a book he wrote upon "Vaccination, its Value and Alleged Dangers," where he says, at page 93, "Vaccination is not a thing to be trifled with, or to be made light of; it is not to be undertaken thoughtlessly or without due consideration of the condition of the patient, his mode of life, and the circumstances of season and of place. Surgeon and patient should both carry in their minds the regulating thought that the one is engaged in communicating, the other in receiving into his system a real disease, as truly a disease as small-pox or measles; a disease which, mild and gentle as its progress may usually be, yet nevertheless now and then, like every other exanthematous malady, asserts its character by an unusual exhibition of virulence." If this opinion, which I regard as

coming from a very high authority, is a correct opinion, then, in addition to the deductions which we have already made, you must inevitably sweep away the whole number of infantile vaccinations because it is impossible for the patient in that case to carry any thought whatever in his mind; therefore, if this is a condition of successful vaccination it at once sweeps away the whole infantile vaccination.

16,889. (*Chairman.*) You do not mean to suggest that he meant to put that as a condition of successful vaccination; he surely means a patient who is of an age to understand?—His language implies that, whatever his meaning may be, I presume he means what he says, and if that is a condition of successful vaccination we should have that further deduction to make from the amount of assumed "protection" supposed to exist in the population.

16,890. Does that conclude all you have to say upon this table?—Yes, I think that is all, but I should like to refer now to the question of pock-marked faces.

16,891. (*Dr. Bristowe.*) I want to ask you with reference to your Table 15 how you arrive at the estimate of the number of the population upon which you make the per-centages?—I have already explained that the populations have been calculated upon the basis adopted by the Registrar-General according to the census returns, and an addition made, for three months from April to the end of June, for the increase of population up to the middle of the year.

16,892. But have they been corrected backwards, so to speak, because the estimates which are made are generally very inaccurate?—Yes, that is true, but the whole of these have been corrected back from the census of 1881. Since 1881, the calculations were made before the recent census, of 1891. Consequently there has been no correction made from 1881. Since that year I have accepted the Registrar-General's estimates for the population.

16,893. Who has made the calculations to which you refer; your Medical Officer or yourself?—I have made them, because the Medical Officer has made no attempt to rectify the usual inaccuracies at all, except in his report for 1889, in which he gives a retrospect of 30 years. Proceeding now to the question of pock-marked faces, I find, in the annual report of the National Vaccine Establishment for 1822 these words occur: "As a proof of the protecting influence of vaccination, we appeal confidently to all who frequent theatres and crowded assemblies, to admit that they do not discover in the rising generation any longer that disfigurement of the human face which was obvious everywhere some years since." This statement is repeated in their annual report for 1825, and it is also repeated again in the annual report for 1831 by Dr. Epps, the director of the Royal Jennerian Society. Fifty years afterwards the "Lancet," on June 29th, 1872, laments "the growing frequency with which we meet persons in the street disfigured for life with the pitting of small-pox. Young men, and, still worse, young women are to be seen daily whose comeliness is quite compromised by this dreadful disease."

16,894. (*Chairman.*) Who writes that?—That is in the "Lancet" of June 29th, 1872.

16,895. But is it signed?—I do not know who writes it. This is an extract from the "Lancet" of that date, so that the remark which was made in 1822 is certainly not substantiated in 1872 after half a century of vaccination.

16,896. That is to say, some unknown individual says that that is his experience, but one cannot accept as a fact if it contradicts other experiences, the experiences of an anonymous writer in a public journal?—In answer to that I will state my own personal experience in 1887. I went to Birmingham to see the laying of the foundation stone of the new law courts, by Her Majesty the Queen, and in walking about the town with a friend I noticed an enormous number of pock-marked faces. I observed to him that if this had been seen in Leicester, it might have been remarked that there was no ground for surprise, but in such a well vaccinated town as Birmingham it seemed to be a remarkable thing.

16,897. When you say "an enormous number," what do you mean?—A very large proportion, that is considering the assertion so frequently made, that they are not now to be met with.



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16,898. But what do you call the very large number you saw of pock-marked people in Birmingham amongst the crowd that day?—I saw every few minutes someone amongst the crowd who was deeply pock-marked.

16,899. (*Sir James Paget.*) How many persons would you have seen who were not pock-marked?—A very large number.

16,900. Could you give the Commission the proportion?—I could not.

16,901. (*Chairman.*) Could you give the Commission at all the number you saw?—I could not definitely.

16,902. Approximately?—I daresay I saw 50 or 60.

16,903. (*Dr. Bristows.*) I suppose in a crowd you might see the same people over and over again?—Yes, but as we were moving from place to place that would not be likely.

16,904. (*Professor Michael Foster.*) Except that they might be moving too?—Yes, they might possibly be moving too.

16,905. (*Sir Guyer Hunter.*) We have read of the devastations caused by small-pox in early periods; do you think the proportion of the people you saw marked with small-pox bore any proportion to the number so marked in early periods, from what you have read?—I question whether they did.

16,906. You admit that I am right in my implication?—I do not think they did bear quite so large a proportion as that said to exist some years ago. But surely some qualification is required in favour of the present improved mode of treatment and nursing in the hospitals.

16,907. (*Mr. Meadows White.*) Might I ask how many years' experience you have had? I am not going to ask your age, but how many years' experience have you had upon the subject?—If you mean since I looked more particularly into this question, it would be from the year 1869, or at a period of 22 years.

16,908. (*Dr. Collins.*) The question has been put to you with regard to former times. May I ask whether it is not acknowledged that there have been periods of the world's history when, so far as historical facts may be trusted upon the matter, they appear to show that no small-pox prevailed over large areas of Europe and elsewhere?—Yes. Practically I believe that small-pox as we know it to-day is comparatively a recent disease in some localities.

16,909. There are also large continents, are there not, where it was almost unknown?—I understand so.

16,910. (*Chairman.*) Does that conclude all that you have to say in regard to this table?—Yes. That is all.

16,911. What is the next point that you desire to bring before the notice of the Commission?—I think now that Sir Guyer Hunter is here I had better refer to the question he addressed to me a fortnight ago. It is Question 16,527. Sir Guyer Hunter referred me there to the question of Professor Michael Foster, Question 16,184. Professor Michael Foster asked me whether I knew what the small-pox mortality was per month for the year 1872, and my reply was: "The whole small-pox mortality of the year was very high, but I cannot tell you what it was month by month except from those extracts such as I read from the newspaper. One of the newspapers says the town was very healthy, and that the number of deaths from all causes was no more than if we had no epidemic."

16,912. (*Sir Guyer Hunter.*) This question of mine had more especial reference to statements you made from the "Vaccination Inquirer"?—Yes, as to the large mortality in 1872. I have carefully read that article in the "Vaccination Inquirer," which is not a statement I made, but it is a copy of some newspaper letters published in Leicester. The whole of the article is not here, but so far as I have read it from the "Vaccination Inquirer" I can find no such statement as that which you attribute to me.

16,913. This was taken from the "Vaccination Inquirer"?—Yes, I have the "Vaccination Inquirer" for 1888, which, at page 203, refers to this subject.

16,914. I had the figures with me on that occasion, but I have not brought them with me to-day?—I think I had better read the words which refer to our mortality. They are just before and just after the table of zymotic mortality, page 203 of the "Vaccination Inquirer," for 1888, Volume IX.

16,915. But you are the author of these papers, are you not?—They are letters which I wrote to a local newspaper in Leicester which had been copied into the "Vaccination Inquirer."

16,916. But still you are the author of these statements?—Yes, no doubt, but if you refer to the paragraph on page 202 of the "Vaccination Inquirer," the editor explains the circumstances under which these letters have been copied. The only paragraph I can find alluding to the subject you brought up, namely that I made the statement that 1872 was a healthy year, is found at the top of page 203, second column, which reads as follows, it says: "Why small-pox should remain the *bête noire* of our medical men is difficult to conceive, in view of the following table, which shows us at a glance our principal zymotic enemies." Some of these are seen to be much more formidable than small-pox. Then after the table we read: "Thus, small-pox is accountable for only 380 deaths out of a total of 10,389 deaths due to the seven principal zymotic diseases. When it is borne in mind that this period of 20 years shown on the table includes the great small-pox epidemic of 1872-73, and at the same time embraces the years which have witnessed the great decline of vaccination in the borough, from 3,730 operations in 1873 to only 598 in 1886, the contrast is remarkable. Diarrhoea accounts for nearly half the huge total of upwards of 10,300. In spite of the evidence by which the foregoing statistics prove small-pox to be comparatively a small contributory in the general mortality, our Medical Officers, past and present, have given it an absurdly exaggerated predominance and attention." These are the only passages in the whole article I can find which favour —

16,917. But you stated that in 1872 the general mortality was no higher than in healthy years?—I am unable to find that statement. On the contrary, in the answer I gave to Professor Foster I distinctly stated it was higher. I said, in answer to Professor Michael Foster at Question 16,184 that the whole mortality of the year was very high, so that I said just the contrary to that which you understood me to say.

16,918. (*Professor Michael Foster.*) That is mortality by small-pox; my question was as to small-pox mortality?—Whether that answer applied to small-pox or general mortality it is equally correct, because the whole mortality of that year was very high.

16,919. (*Sir Guyer Hunter.*) I stated in my question that the year 1875 had a much higher rate of mortality than 1872, but there were special causes for that owing to epidemics of scarlet fever, whooping-cough, and 308 deaths from diarrhoea; and I understood you to reply that the high rate of mortality was not due to the other diseases, but rather to small-pox, and Professor Michael Foster put that question to you and you answered it with reference to small-pox and not with reference to other diseases than small-pox?—Respecting 1875 I may say you are somewhat in error as to the "much higher rate of mortality" for that year, the general death-rate for 1872 being 27 per 1,000, while for 1875 it is but 27·3. Although my answer to Professor Michael Foster had reference primarily to small-pox, it also applied to the general death-rate and is equally true of both. My reply will not bear the construction that it was due to small-pox alone and not to other diseases.

16,920. Do you wish to correct that statement?—Certainly not, I do not wish to correct any statement. The answer there given was absolutely accurate.

16,921. I put it to you that you had stated that in 1872 the general mortality was no higher than in healthy years, whereas I understand you to restrict your observation now to the mortality from small-pox, not from general diseases?—I have never made the statement that you ascribe to me; on the other hand, I think you referred me to several epidemics, or rather the high prevalence of several other diseases, which accounted for the high mortality in 1875; I think you did that.

16,922. Yes, I pointed that out by my question?—Whereas in this particular year, 1872, we had an epidemic of measles and whooping cough and of scarlet fever and of diarrhoea to add to the small-pox mortality which altogether contributed to the high mortality for that year, and it is a question whether you ascribe the high mortality of 1872 to the single epidemic of small-pox or to the three or four epidemics of other diseases.



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(*Sir Guyer Hunter.*) I accept that statement; it is as much as I require.

16,923. (*Dr. Collins.*) Did I understand that you have never made any statement to the effect that the general mortality for 1872, excluding small-pox, was exceptionally low?—Yes. I never have to my knowledge made the statement at all anywhere; in fact I could not make such a statement, knowing the mortality for the year was very high. There was one other point that Sir Guyer Hunter referred to. I do not know what years are included in the decade he referred to, but I presume from 1871 to 1880.

16,924. (*Sir Guyer Hunter.*) I believe it was that?—If that is so, the mortality for 1880 is much higher than that of 1875 or 1872. Then I might ask permission to refer to a question of Professor Michael Foster's (Question 15,495). At the time I was putting in the table of injuries and deaths attributed to vaccination you will remember that one of the parents attributed to vaccination what they call "a sort of foot-and-mouth disease." I judged (I do not know whether my impression was wrong) that Professor Foster was of opinion that it was impossible for a child to suffer from foot-and-mouth disease, but I noticed in the "Lancet" of June 13th of the present year (1891) that there were some cases of foot-and-mouth disease in a human subject cited by a medical man. The name of the medical man is G. A. Bannatyne, M.B. Glasgow. I think his testimony is a justification of the opinion of the parent.

16,925. (*Chairman.*) What is the next matter which you wish to bring before the Commission?—I would now like to lay before the Commission some facts respecting the seven principal zymotic diseases. If the facts already presented to the Commission showing that the mortality from small-pox in Leicester was highest when vaccination was highest, and lowest when vaccination was lowest, stood alone, our case against vaccination would be a very strong one, but when supplemented with further facts respecting zymotic mortality, which also show the highest death-rate during the period of highest enforcement of vaccination, the case against vaccination in my judgment becomes impregnable. In grouping together the seven principal zymotic diseases, we have a more general basis of calculation, and to my mind a more reliable because a broader basis, than what we obtain when we separately examine each of the diseases classed in that group. I have taken them out separately for each year, and have also arranged them in quinquennial groups similar to those already used for small-pox; and I find that whichever way they are tested, and under whatever circumstances, the evidence they give is as equally conclusive against vaccination as that which I have already laid before the Commission respecting small-pox.

16,926. What are the zymotic diseases you take?—Small-pox, measles, scarlet fever, diphtheria, whooping cough, the group of fevers (typhus, typhoid, and simple continued fever), and diarrhoea. I will now hand in Table 16; I think the tables I am now bringing before the Commission, with the investigation into the relation of the seven principal zymotic diseases show that vaccination not only fails to prevent small-pox, but becomes an active and exciting cause of and distributor of disease. (*The table was handed in. See Appendix III, Table 16, page 438.*) Table 16, gives the total number of our deaths from each of the seven principal zymotic causes for each year, from 1838 to 1889 inclusive. To make the table as continuous and complete as possible I have taken for the years 1838–58 all the deaths ascribed at that time to sore throat, and putrid or malignant sore throat, as diphtheria, and have classed them under that head. Deaths registered as occurring from inflamed and ulcerated throats are also included, until the term diphtheria itself comes into use, in 1859. The heading diarrhoea also requires explanation. In the year 1838 and on to 1851 I found in the register of deaths a large number of deaths attributed to "inflammation of the bowels." On examination I concluded that these ought to be added to the deaths registered from diarrhoea. In 1833 there were 45 deaths from inflammation of the bowels and only one from diarrhoea. In 1839 there were 46 "inflammation of bowels" and 3 "diarrhoea." In 1840, out of 116 deaths classed as "diarrhoea" in this table, 99 are called "inflammation of bowels." In 1841 there are 82 out of 97; in 1842 there are 64 out of 88; in 1843 there are 36 out of 62; in 1844 there are 53 out of 75; in 1845 there are 40 out of 61; in 1846 there are 41 out of 237; in 1847 there are 28 out of 95; in 1848 there are 61 out of 129; in 1849 there are 33 out of 124;

in 1850 there are 9 out of 89, and in 1851 there are only 8 out of 162. This gives a total number of 635 deaths registered from "inflammation of bowels." Of this total 336 occurred in the quinquennium 1838–42, being an average annual rate of 67·2, and equalling an average annual death-rate in the quinquennium of 1,345 per million. During the years 1843–47 the number of deaths from this cause (that is inflammation of bowels) fell to 198 or an average annual of 39·6 or 723 per million. From 1848 to 1851, a period of four years, the number of these deaths fell to 101, or 25·25 average annual, being equal to 427 per million per annum. The whole of these deaths are included under the head "diarrhoea" and materially affect the mortality rates in subsequent tables. This Table 16 is one of absolute numbers, but it will be seen even in this table that an enormous rise in the number of zymotic deaths takes place in 1868 and continues throughout the years when vaccination was so rigorously enforced. The fatal period for small-pox is also the fatal period for the seven principal zymotic diseases. This table shows the insignificant per-centage of the mortality from small-pox as compared with the total mortality of the seven principal zymotic diseases. I will now hand in another table which is a summary of Table 16, and it gives the total mortality from the seven principal zymotic diseases with the relative per-centage of deaths under each disease to the total zymotic deaths. (*The table was handed in. See Appendix III, Table 17, page 439.*) The total number of deaths registered in Leicester from the seven principal zymotic diseases for the 52 years, 1838 to 1889, is 21,580. Of this enormous number small-pox is only accountable for 1,081, or 5 per cent., being a very insignificant per-centage of the whole number. Diphtheria gives even a smaller number, being only 304 deaths, or 1·4 per cent. Whooping-cough gives 2,176, or about 10 per cent. Measles caused 2,855 deaths, or just over 13 per cent. Fevers caused 2,858 deaths, or 13·3 per cent. Scarlet-fever caused 2,987 deaths, or 13·8 per cent., while diarrhoea was the cause of 9,319 deaths, or 43·2 per cent. of the total deaths from those seven kindred diseases.

16,927. This will not be an example, I suppose, of the proportion of deaths from those diseases generally throughout the country?—I have made no comparison with the country.

16,928. Diarrhoea is specially prevalent in Leicester, is it not?—It is, especially at certain seasons of the year.

16,929. Therefore probably diarrhoea would bear a larger proportion upon this table than it would in other places?—I have no doubt it does compared with many places. Taking the whole period of 52 years, out of every 1,000 deaths from the seven principal zymotic causes, there were 14 from diphtheria, 101 from whooping cough, 132 from measles, 132 from fevers, 139 from scarlet fever, 432 from diarrhoea, but only 50 from small-pox. Therefore, excepting diphtheria, small-pox has all along been the least fatal, and the disease least to be feared. The mortality even from whooping-cough was more than double that from small-pox, while the mortality from fevers, measles, and scarlet-fever each amounted to nearly three times that of small-pox. Diarrhoea was the cause of nearly nine times the number of deaths which occurred from small-pox.

16,930. In your Table 16 it is the actual number of deaths from each disease, not in proportion to the population?—It is not a proportion or rate, it is the actual number.

16,931. Taken from the Registrar-General's returns?—No. Not from the Registrar-General's returns, but from the local returns.

16,932. Where are they to be found?—In the health reports for Leicester, but you will find that many of these figures are corrected by the Medical Officer, in his reports, from time to time. For instance, there is one in particular; small-pox is given for the year 1872 as 346, and in some subsequent year that number gets transposed into 366, and after being carried on as 366, three years further on it drops down again to 346. Our present Medical Officer gives in his report for 1889, only 314, which is the number of deaths which actually took place only within the borough. He leaves out the number of deaths attributable to borough patients dying in the Fever Hospital at present outside the boundary. This number is included in the 346 deaths for that year. You will also find similar corrections required for other years.



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16,933. Where did you get the figures from before the Medical Officer's reports?—We have gone through the death registers at Leicester for those. I think the Medical Officer's reports date from 1853 continuously. I will now hand in another table which gives the total and average annual number of deaths from each of the seven principal zymotic diseases in quinquennial periods, with the average annual per-centage of registered vaccinations to total births. (*The table was handed in. See Appendix III., Table 18, page 439.*) The zymotic diseases are from 1838 to 1889, and the vaccinations from 1849 to 1889. This table is also one of absolute numbers and shows that the highest number of small-pox deaths, and the highest number of zymotic deaths were coincident with the highest period of vaccination, 1868-72. Taking small-pox first, the number of deaths from this disease in the fatal vaccination period of 1868-72 is 359, thus exceeding any other period by 173 deaths, being nearly double the next highest period and 261 deaths in excess of the average for the eleven periods. Those small-pox deaths occurred at the very time, when from a vaccinator's point of view, the mortality should have been lowest. The average annual small-pox deaths, therefore, were 71·8, or 34·6 above those of the next highest period; and 51 deaths for each of the five years 1868-72 (when vaccinal "protection" was supposed to be strongest) in excess of the annual average for the 52 years 1838-89. Measles shows a similar result. The deaths from measles during these five fatal vaccination years were 403, being 39 above the next highest period, and in excess of the periodic average number by 144 deaths. The average annual deaths from measles for this fatal vaccination period were 80·6, being nearly eight above the next highest average annual number of deaths, and nearly 26 deaths in each of these five years above the annual average for the 52 years 1838-89.

16,934. Is this for the purpose of suggesting that the vaccination caused those people to die of measles, scarlet fever, and those other diseases?—I do not suggest that at this moment.

16,935. You keep on speaking of the "highest period" and the "fatal vaccination period;" what is the view that you suggest the table proves?—I believe all these tables show that the large fatality from diarrhoea was at least intensified by the rigorous manner in which vaccination was enforced at young ages.

16,936. (*Dr. Collins.*) I have observed in one of the reports made to the Commission by a medical inspector that in his opinion the infection of scarlatina along with vaccination proved more dangerous and fatal than the infection of vaccination alone or of scarlatina alone; do I understand that you suggest that possibly the complication of vaccination with one or other of the zymotic diseases may have led to the increased mortality during what you specify as the "highest vaccination period"?—With some of them, I believe it undoubtedly has.

16,937. (*Chairman.*) But so far as this table shows what you call the "highest vaccination" period from 1868 to 1872, the average of scarlet fever was 79·4, whereas, in the next period but one, when vaccination had diminished, it was 98·4?—Yes; but there would be the increased population to consider, and when you look at the figures, with relation to population, it is evident that it must have been more fatal in 1868-72.

16,938. (*Sir James Paget.*) Have you compared your figures with those of other large towns in which vaccination has been continued to see whether in them there has been an increase in zymotic diseases with vaccination?—Yes, I have made a comparison in some cases.

16,939. And with what result?—Speaking from memory (I am not quite sure whether I have the tables here), I made a comparison with Brighton, with Keighley, with London, and with Sheffield.

16,940. Why were those four towns selected?—I selected Brighton because recently the health of Leicester has been so good that it is classed with Brighton by the Registrar-General as a healthy town, and I thought that if we compared Leicester, which formerly was sometimes spoken of as an unhealthy town, especially in regard to zymotic mortality, with a town which is regarded as a healthy one, the contrast would be quite as great as we could possibly have. With Keighley I made the comparison because that is an anti-vaccination district. I am not sure that I had any

particular reason for comparing Leicester with London, except that, as a rule, I think the death-rate for London is usually lower than the average for the large towns, grouped together by the Registrar-General. I compared it with Sheffield because Leicester and Sheffield are so frequently brought into comparison that a comparison with Sheffield was almost inevitable; but I will refer to these towns, if you will permit me, when I come to the ratio tables.

16,941. (*Chairman.*) Of course, if you are going to deal with that when you come to the table of rates, there is no use in putting questions upon it at this time, otherwise if you take whooping-cough, a similar argument would lead to the conclusion that a high vaccination was favourable to a diminution of whooping cough, and that the cessation of vaccination was favourable to the increase of whooping-cough, would it not?—Yes, at first view it might appear so, but if you look at all the periods, you will find that it is rapidly declining with diminished vaccination; but even in whooping-cough the deaths for 1868-72 are above the average.

16,942. But taking your different periods, in that which you call the "highest vaccination period," the average annual deaths are 44·8, in the next five years they are 59·2, and in the next five years they are 62·2?—But the comparisons I am making are these, that in the years referred to we get the highest total number of zymotic deaths in that particular period; and, therefore, regardless of the population, if there are a greater number of deaths, the death-rate must presumably be higher.

16,943. You do not get the highest number of whooping-cough deaths in that period, and I was asking you, supposing you were to apply the same process to whooping cough as you do to measles, making the same suggestion that there is a connexion between a high rate of vaccination and the existence of one zymotic disease, whether that would not apply to whooping-cough; it is no use applying it to only one of these diseases?—Even the whooping-cough is above the average, whereas from the tendency of our sanitary measures it ought to be below.

16,944. But with increased sanitation it is still more above the average, is it not?—It is above the average for one or two periods, but there is the largely growing population to take into account.

16,945. If you like to deal with proportions to population, deal with proportions to population. If this table is not of value because it does not deal with proportions to population, let us leave it and go to the table which does deal with proportions to population; you were dealing with inferences from actual numbers, were you not?—Yes, but the table of rates will be found to support the arguments I have advanced on actual numbers.

16,946. If then your inference was right that there was a connexion between vaccination and measles or between vaccination and scarlet fever, in the sense that if you had much vaccination it caused many deaths from scarlet fever, why does not the table show that for the same reason diminished vaccination must have caused diminished death by whooping-cough?—But I have never said that I regard vaccination as the only controlling factor with this disease in the sense that medical men affirm that vaccination alone controls small-pox. I was dealing with that portion of the table which showed the highest number of deaths for certain diseases for that particular period.

16,947. But you must also take those diseases which show a smaller number for this particular period?—If you would kindly look at column 10, which gives the total for the whole group, I submit it is perfectly fair, taking them altogether, to show that that figure is enormously higher than any other, irrespective of any increase of population.

16,948. What figure?—The total number of zymotic deaths in period VII., being 3,182, which includes the smaller numbers as well as the larger. It is obvious if that number is the highest with its population, it is far more intensified when we come to consider the rates.

16,949. (*Dr. Collins.*) I suppose there are other causes which would influence the rise and fall of the various zymotic diseases besides vaccination and small-pox, if they exert any influence?—Yes, no doubt of that. There are other influences besides that of vaccination.



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16,950. (*Sir William Savory.*) I thought your answer to Dr. Collins just now was that these tables were intended to show that there was an influence exerted by vaccination upon scarlet fever and similar diseases; the suggestion came to you from Dr. Collins, and you accepted it?—Yes; in regard to some of them.

(*Dr. Collins.*) The suggestion I made really came from Dr. Acland.

16,951. (*Sir William Savory.*) That answer would imply that the tables are really good for nothing, because other causes may have produced the result?—That does not impugn the tables at all; vaccination might be the one contributory cause, or it may be one amongst others, but this does not necessarily invalidate that one as a contributory cause, and these tables are valuable as indicating that influence.

16,952. (*Chairman.*) Why do you call from 1868 to 1872, which you say is the period of highest vaccination, the period of the greatest number of deaths from zymotic diseases; surely from 1873 to 1877 is a period of greater vaccination than from 1868 to 1872?—Not proportionately.

16,953. You mean not proportionately to the births?—Not proportionately either to the births or to the population.

16,954. (*Sir William Savory.*) Was it measles that you suggested had relation to vaccination?—The suggestion I made was principally in regard to diarrhoea, and the suggestion referred to by Dr. Collins was to scarlatina.

16,955. (*Sir Edwin Galsworthy.*) But it does not apply to diarrhoea, because in 1868-72 your table appears to show that diarrhoea stood at 293·6, when the per-centage of vaccinations was 91·7, and in 1883-87 diarrhoea was 236·2, when vaccination drops to 29·9 per cent. P—Yes, and the figures you have quoted from my table bear out what I have said. I have never asserted that the fall is mathematically proportionate as between the two sets of figures. The tables prove that vaccination must have had a very great influence on the mortality, although there might be a fall in the amount of vaccination without an absolutely corresponding fall in the deaths from the diseases mentioned.

16,956. (*Chairman.*) In your period, from 1868 to 1872, the very large number of deaths is chiefly made up by taking the large number of deaths from scarlet fever in the years 1870 and 1871, when there was an exceptionally large number of such deaths, and from measles in 1868?—There are a large number of deaths from measles, and also from diarrhoea in 1868.

16,957-8. From diarrhoea not an extraordinarily large number as compared with the others; from diarrhoea it is 349, and in the subsequent years the numbers are 272, 240, 302, and 305?—I think that your Lordship is somewhat in error, because 1868 is not only the highest of the five years you have quoted, but it is also the highest year but one (1880) for the whole range of 52 years.

16,959. Still from scarlet-fever you had in 1868 nine deaths; in 1869, eight; in 1872, five; and you had in 1870, 263, and in 1871 you had 112. Now 1869 and 1872 were years of a great amount of vaccination, were they not?—Respecting 1869 and 1872, there was then a great amount of vaccination.

16,960. Yet in those years you find a very low death-rate from scarlet fever; a very much lower death-rate than you find in subsequent years when vaccination had very much diminished?—The predominance of zymotic mortality runs in varying channels for different years. It prevails first in one disease and then in another.

16,961. But surely when one is considering whether the deaths from scarlet fever are affected by vaccination, if they are affected by vaccination, they would be likely to be affected, if not within the same year, at all events, within some limited time?—Yes, within some limited time, and that is one reason why I prefer five year periods to the selection of odd and single years.

16,962. Because the danger suggested is getting scarlet fever before they had recovered from vaccination, is it not?—Not exactly before they have recovered from vaccination in the orthodox sense of the term, but in consequence of the weakening process of vaccination.

16,963. Before they have got fully restored; possibly you might hold that they never get restored; I had better say before they get so far restored as they will

get restored after being vaccinated. But must you not, in order to ascertain whether that is the case, look at the deaths from scarlet fever during a time of great vaccination and during a time of small vaccination. It is true that you point to a large amount of scarlet fever during that time, but still that scarlet fever is concentrated in two of those years, and there is very little of it to be found in the two years before or the two years after; does not that rather raise a doubt as to whether it is likely to have been the case, especially when you find that in 1868, 1869, 1872, and 1873, which are years of high vaccination, you have only nine, eight, five, and six deaths; whereas when you come to later years, such as 1882, 1883, 1884, and 1885, when you say you had very little vaccination, you have as many as 72, 91, 63, and 113?—But in these particular years the deaths are distributed amongst other zymotics; if they die of one disease it is impossible for them to die of another. Besides even in the years you mention we had a considerable amount of vaccination.

16,964. (*Dr. Collins.*) I observe with regard to diarrhoea that 1868 is the highest of the whole series, with the single exception of the year 1880?—It is.

16,965. (*Chairman.*) And 1868 is the highest with measles too?—Yes, and 1868 was the first year of penal enforcement of vaccination.

16,966. (*Mr. Picton.*) Is this the idea you are putting before the Commission, that there are signs that the practice of vaccination tends to increase the mortality from seven, or at any rate six, zymotic diseases—signs that it tends to increase the total mortality from them all taken together?—The actual facts prove that there was a great increase of the total zymotic mortality coincident with the increased enforcement of vaccination.

16,967. But it does not follow that it has a special influence upon one particular disease; sometimes the course of fatality will run in one disease and sometimes in another?—That is the case, as I have already stated that.

16,968. But taking them altogether you think these tables show that vaccination has an influence upon the total mortality from zymotic diseases?—Yes, and a detrimental influence undoubtedly.

16,969. (*Dr. Collins.*) Would it be right to suggest that your view is that a vaccinated infant exposed to a prevalent zymotic disease is more likely to die than it is when zymotic disease is not prevalent?—Yes, I should think a vaccinated child—*cæteris paribus*—would be more likely to suffer, or die, from any of the zymotic diseases which happened to be prevalent.

16,970. (*Sir William Savory.*) Do you think that the tables show that?—I think this group of tables does so, unquestionably. Under any circumstances it is rather a remarkable coincidence that just at the period when vaccination was most fully carried out there should be such a great increase of zymotic mortality.

16,971. (*Chairman.*) What period are you referring to?—From 1868 to 1872.

16,972. But when you say from 1868 to 1872, of course you shut your eyes to the existence of there being such a thing as an epidemic; you do not consider there is such a thing as atmospheric conditions which cause an epidemic?—I do not close my eyes to that at all. On the contrary I have admitted there may be other influences, but vaccination I thought was intended to prevent epidemics of small-pox.

16,973. When you speak of it as being extraordinary that there should be this high rate during the vaccination period, I should be struck with it if I found that a particular disease, such as scarlet-fever prevailed throughout the period when vaccination was prevailing; but if it all arises from a very exceptional number of deaths in one or two particular years, surely the inference is much less strong, is it not, to show that the two are connected?—But then the consideration is not primarily respecting the relation of scarlet-fever to vaccination, but between vaccination and small-pox, and it is for those who advocate vaccination as a protection from small-pox to explain why we suffered from a terrible epidemic of small-pox when we were supposed to be protected by vaccination.

16,974. But I am not talking about advocating anything, I am reasoning with you; does not it strike you that the importance of the suggestion that in the period from 1868 to 1872 you find an exceptionally large number of deaths from scarlet fever is very much diminished



when you find that the high number of deaths from scarlet fever was not spread over the period, but resulted from exceptional occurrences in one or two years?—I do not think there is anything extraordinary in that; because we find the same thing takes place with other diseases in other years, and I might venture to observe that if a witness in favour of vaccination brought forward facts of this character to show conversely that there was an exceptionally low death-rate instead of an exceptionally high one, he would point to it at once as a result dependent upon vaccination.

16,975. (*Dr. Collins.*) Should I be right in saying that most of these zymotic diseases affect young children very largely?—Yes, very largely; the infantile death-rate considerably increased in the same fatal vaccination period.

16,976. And of course vaccination chiefly occurs with young children and infants?—Yes, particularly at that time; there were more vaccinated young than there have been in subsequent years.

16,977. Should I be right in saying that it would not be an unlikely thing for vaccination to concur with the presence of one or more zymotic diseases?—It is the usual thing, I think.

16,978. Under those circumstances do you suggest that the zymotic disease is more likely to be fatal?—Yes, I do, on account of the impaired vitality.

16,979. (*Professor Michael Foster.*) During the last year in any of those diseases, such as diarrhoea, has the relative mortality of those under one year (the time when vaccination would have been performed), diminished, do you know?—I believe it has largely.

16,980. Do your facts show that?—I am not sure whether I deal with that aspect of the question later on, but I believe I do. At any rate I do deal with the general death-rate at younger ages.

16,981. Has the relative mortality of children under one year has markedly decreased in the case of diarrhoea, say, since the year 1878?—In regard to diarrhoea alone I could not positively say, but in reference to the deaths from all causes it has considerably decreased, and so has vaccination.

16,982. (*Mr. Bright.*) Your idea is, I suppose, that the increase of deaths from various zymotic diseases during and after the great vaccination period might just as reasonably be attributed to the vaccination as the great decrease in the deaths from small-pox if that had occurred after a larger amount of vaccination?—Yes, quite so. Our opponents would not have hesitated under the circumstances you mention, had they existed, to put in a claim on behalf of vaccination.

16,983. (*Mr. Meadows White.*) The deaths in your Table 16 are divided into each year, showing the actual number of deaths?—Yes.

16,984. That does not always concur, does it, with the quinquennial average?—Not by any means.

16,985. In 1868, taking one instance, measles are 247, and diarrhoea 349 (two high figures); then in 1872 measles are only 36, and diarrhoea 305; if you take year by year you will not find any special concurrence, will you, between the number of vaccinations and the number of deaths from particular diseases?—Not if you pick out specific diseases, but if you group them together you will find that this group of five years (1868–72) is higher than any other.

16,986. (*Chairman.*) Unless it affected the children who were then vaccinated there could be no connexion, could there, between the high rate of vaccination and the diseases. I mean the rate of vaccination to births was high then, but that vaccination would only affect a very small proportion of the population?—It would only affect a very small proportion of the population, whether for good or evil, but that proportion would be the younger part of the population.

16,987. It could only affect those, to use your own view (we are not talking now of protection), who were vaccinated in the years between 1868 and 1872?—Yes.

16,988. That would be a very small proportion of the population?—Yes; that would be a very small proportion of the population, but the mortality being so high amongst that proportion it distinctly raises the general mortality. I propose putting in a table later on showing that the fall in deaths above 15 years is continuous right through, whereas the deaths at the younger ages, 5, 10, and 15 are irregular, and are considerably raised

at this particular period of high vaccinations (1868–72), especially the deaths under the age of five, where the saving of life, if any, ought to be manifest.

(*Professor Michael Foster.*) According to the numbers worked out by the Secretary, the proportion of those dying from diarrhoea under one year has not diminished since 1880; the numbers he has worked out are as follows: The per-centage of those dying from diarrhoea under one year of age, to those of all ages dying of that disease, for the year 1880 is 69; for 1881 it is 87½; for 1882 it is 82½; for 1883 it is 87; for 1884 it is 80; for 1885 it is 90½; for 1886 it is 89½; for 1887 it is 84½; for 1888 it is 80½; and for 1889 it is 86. Those are the per-centages out of 100 persons dying from diarrhoea in each of those years, so it appears that there has been no relative diminution in those dying under one year.

(*Dr. Collins.*) On the total deaths?

(*Witness.*) I find the table you have now handed to me only goes back to the year 1880, but to make the comparisons I wish to make, it ought to go back to 1868. It would then be seen that there has been a great reduction in our total diarrhoeal mortality. The figures you have quoted only indicate that the mortality in the higher ages has decreased more rapidly than the mortality under one.

16,989. (*Professor Michael Foster.*) It is instructive enough dating from 1880?—There is a considerable rise for the years 1885 and 1886, but apart from that it appears to follow pretty much the same average. I think, it is simply a question of age incidence.

16,990. (*Chairman.*) What is the next table to which you wish to direct the attention of the Commission?—I wish now to put in Table 19. (*The table was handed in. See Appendix III., Table 19, page 440.*) Table 19 gives for the 52 years, 1838–89, the annual deaths per million of population from each of the seven principal zymotic diseases with the annual per-centage of registered vaccinations to the total births, 1849–89. This is a table of per million rates.

16,991. (*Mr. Meadows White.*) Still in Leicester?—Yes, these tables are all for Leicester.

16,992. (*Chairman.*) These are calculations made by yourself from what—from the census returns?—Yes; from the census returns corrected for the intercensal years.

16,993. Corrected by yourself or by any public authority?—They were corrected by myself. I think I explained that there were very great variations in our Medical Officer's reports from the estimates made by the Registrar-General. We have been able from the census of 1881 to work backwards and correct up accurately the populations for the intercensal years. In Table 19, as in the preceding tables, small-pox shows the highest mortality for 1872, and this mortality exceeds the death-rate of the next highest year, which is 1845, by 529 per million, and the average annual small-pox death rate by 3,242 per million. There is a slight difference between the periodic average death-rate, or the average of the 11 quinquennial periods, with which my tables are divided, and the annual average small-pox death-rate; the latter being exceeded in 1872 by 3,242 and the periodic average by 3,234. Still dealing with the five fatal years of highest vaccination, 1868–72, we find that measles records its highest mortality in 1868, being 2,843 per million; and exceeding the next highest year, 1845, by 85 per million, and it also exceeds the average annual death rate for this disease by 2,150 per million. Scarlet fever, to which we have been referring, is very fatal for both of the two years 1870 and 1871; the more fatal year of the two, 1870, is only exceeded in its death-rate by one year, 1863; but both 1870 and 1871 far exceed the average death-rate for scarlet fever; 1870 being 2,169 above while 1871 is 512 per million in excess of the annual death-rate for this disease. The mortality from diphtheria is also very high, exceeding the average in four years out of the five under review, from 1868 to 1872. As regards whooping-cough, two of the same group of years were very fatal, and three of the years, 1869, 1870, and 1872, are in excess of the average periodic death-rate per million. Fevers are higher for 1868–72 than in the preceding five years, although they do not quite reach the periodic average death-rate; but they were much higher than they have been since the decline of vaccination. Diarrhoea is excessively high for all the five years 1868 to 1872. The year 1870 is 530; 1869 is 970; 1872 is

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1,050; 1871 is 1,116, and 1868 is 1,962 in excess of the average annual periodic death-rate per million. The highest death-rate from diarrhoea (excepting 1846, when 41 deaths from inflammation of the bowels were added) is in 1868, the first year after the Vaccination Act of 1867. The total death-rate per million for the seven principal zymotic causes is accordingly very high for each of those five years, 1868-72. Although the highest of the five, 1872, is exceeded by three odd years previously, (namely, 1840, 1845, and 1852,) yet when grouped together, as in my next table, Table 20, which I will shortly hand in, they give by far the most fatal results of any other group of five years in the whole range of the 52 years under consideration. Each of the total zymotic rates for these five years exceed the average zymotic death-rate. In 1868 the excess is 2,862 per million; in 1869 the excess is 82 per million; in 1870 the excess is 2,226 per million; in 1871 the excess is 816 per million; and in 1872 the excess actually reaches 3,213 above the average periodic death-rate per million, being the highest zymotic death-rate known in Leicester for the previous 20 years. We therefore look at these tables in vain for any saving of life through vaccination. When vaccination was in full force there was an excessive fatality from nearly all these seven zymotic diseases, and the loss of life was especially great from small-pox; the very disease vaccination is assumed to beneficially control. Table 20 which I will now hand in gives the average annual death-rate per million of population from the seven principal zymotic diseases in quinquennial periods, with the relative per-centage of the death-rate under each disease to the total death-rate of the seven, and the average annual vaccinations to 10,000 births 1849-89. I have illustrated this table with a diagram, which I will now also hand in. (*The table and diagram were handed in. See Appendix III., Table 20, page 441, and Diagram G., facing page 441.*)

16,994. Reverting to your former table (Table 19) for a moment, since the decline of vaccination, say, between 1881 and 1886, were there not several years in which scarlet fever was much higher than in the previous years, when your vaccination-rate was high? For example, in 1869 the deaths from scarlet fever are given as 89 per million; in 1872 they were 51 per million; in 1873 they were 60 per million; in 1874 they were as much as 174 per million; now compare with that the series of years beginning at 1880 when there were 991; in 1881 there were 1,495; in 1882 there were 571; in 1883 there were 703; in 1884 there were 475; and in 1885 there were 829; those were years in which you had very much less vaccination; does not that suggest a doubt as to the connexion between vaccination and deaths from scarlet fever?—Although the decline is irregular it is continuous and falls very much lower in the later years which your Lordship has not read over.

16,995. I do not see that it does. In 1863 you had the highest, I think, in any year; but from that time, if you take the years 1864, 1865, 1866, 1867, and 1868, when you had much more vaccination than you had in 1881, 1882, 1883, 1884, 1885, and 1886, you will find that the former period compares favourably with the latter, does it not?—No, for a fairer comparison we must also take 1870 and 1871, when compulsory vaccination had been in full operation for three or four years. The death-rate from scarlet fever for 1870 nearly equals that of 1863, being 2,833 per million, and the death-rate of 1871 is 1,176. And I do not know that it compares favourably with the last two periods of all, namely, the five years from 1883 to 1887, and the two years 1888 and 1889, when vaccination was discarded.

16,996. But I was taking two more years than you did, you have a long series of years it strikes me from 1879 to 1885 with a high scarlet fever rate, a much higher rate than you had from 1864 for a similar series of years; take the period from 1864 to 1869?—But I see no reason why epidemic years of scarlet fever should be omitted from this comparison. I think you will find a truer comparison of the mortality your Lordship is now referring to grouped in Table 20. Taking five year groups, you will find that the rate per million for scarlet fever is 866; being no less than 202 per million higher for the years 1863 to 1867 than for 1883 to 1887.

16,997. But then 1863 happens to take in an irregular year when scarlet fever has been higher than at any time, I think, in your whole table. If you exclude that year and take the series of years following that you will find that a different result would be produced, would

it not?—I have no doubt that the result would be altered somewhat if we altered the groups of years; but then we are fixed by the line of 1868, the passing of the Act of Parliament; and to form a proper comparison between one set of figures I present and another we are bound to keep to those periods.

16,998. But it gives a very imperfect view of the whole of the facts to confine one's self to them altogether, would it not; I do not say that one cannot look at them?—It would give an imperfect view to arbitrarily omit the epidemic years, but I do not know that the general results would be altered much even if we altered the grouping of years.

16,999. (*Dr. Collins.*) 1863 and 1864 were the years when there were 3,928 extra vaccinations, were they not?—Yes, and this might have some influence on the then high mortality from scarlet fever.

17,000. (*Mr. Meadows White.*) Is there anything special about the year 1840 which stands out so prominently in the table?—It is a peculiar year; it was low for the birth-rate and high for the death-rate, but I do not know what was the predominant factor, unless it was that distress was very prevalent in Leicester at that time. Diagram G. shows (1.) the average annual death rate per million population from the seven principal zymotic diseases with the relative proportion of deaths from each disease to the total deaths from the seven in quinquennial periods, 1838 to 1889. (2.) An unprecedented increase of zymotic mortality coincident with the highest vaccination period, 1868-1872; and (3.) A marked decline of zymotic mortality also coincident with the decline and practical abandonment of vaccination subsequent to 1872. The black colour at the base of the columns represents small-pox; the next shade lighter represents the proportion of deaths from measles; the scarlet colour represents deaths from scarlet fever; the narrow strip of dark blue represents deaths from diphtheria, and the dark colour just above indicates the deaths from whooping cough; the pink represents the deaths from the group of fevers, the pale blue at the top of the columns the deaths from diarrhoea, while the red curve above shows the average annual registered vaccinations to 10,000 births. This diagram illustrates Table 20. Noticing scarlet fever, of which we have just been speaking, it comes out very vividly on this diagram, but the Commission will see that in the last two columns there is a decreasing quantity, especially in the last column of all, when the vaccination curve almost sinks to the bottom of the diagram.

17,001. (*Chairman.*) But the last column of all is only two years out of five?—But the columns all represent annual averages.

17,002. Yes, but if you took from the period 1868 to 1872 the years 1868 and 1869 your average would have been very small for that quinquennium?—Yes, if you take the highest years out of any quinquennium it would lessen the average, but I think, looking at the scarlet fever, as it is, a change of years would not have made any material difference.

17,003. I am merely speaking about the observation which you have directed to the last column; I say the last column is only for two years. In several of those cases if instead of taking the quinquennials you had taken two years only the result would have been very different indeed. You cannot well compare two years with a quinquennium when you do not know what is coming in the other years?—It was not my province to speculate on the future. But if you wish to omit the last two periods the columns I would like you to compare are from 1838 to 1882. You will see that it is not until we have a distinct decline in vaccination that there is any appreciable diminution in the mortality from scarlet fever. If you were to take one year from any of those columns and move it to another column it would not make any material difference in the average general mortality; it would only modify its distribution.

17,004. It would make a great difference, surely, if you had taken the scarlet fever only for the years 1868 and 1869 out of that quinquennium?—If we were to take out the years 1868 and 1869 and add the years 1873 and 1874 in their place there would not be any material difference; in fact the mortality would be slightly raised.

17,005. But what I am pointing out is that you are comparing in the last column the state of things shown by two years with the state of things shown by five



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years in other columns. I call your attention to this, that if out of the five years 1868 to 1872, you had taken the result shown by two of those five years the result would have been very different?—The result would have been different no doubt, but, speaking from memory, if you add the mortality for the year 1890 it would not have made any material difference to the average annual represented by the last column.

17,006. (*Dr. Collins.*) I understood you referred to the last two columns?—Yes, I did refer to the last two columns as showing a diminution even in the deaths from scarlet fever. In the last column there is very little scarlet fever to show. The columns on the diagram show a considerable fall in the total zymotic death-rate from 1852 to 1862, due to the sanitary improvements which had been introduced. Then after 1862 with the great rise in the number of vaccinations there is an enormous rise in the zymotic mortality, which, notwithstanding improved sanitary conditions, reaches its highest fatality at the very time that vaccination was most rigorously enforced, and when relatively it was carried out to the highest extent. If a line were drawn from the top of the column for 1858–62 to the top of the column 1888–89, it would show the excess of zymotic mortality for each period above what, owing to improved sanitation, should have been a regular decline.

17,007. (*Chairman.*) I am not sure whether it might not make some difference upon the point we were talking of the other day. You take here the period from 1868 to 1872, and when you speak of birth vaccination you mean not the vaccinations performed in that period, but vaccinations having reference to births in that period whenever performed. The high vaccination rate put down here as attributable to 1872, for example, may be, a good deal of it, vaccination performed in 1873. If you are talking of the number of vaccinations, I am not sure whether the years 1873 to 1877 would not have been a higher period than from 1868 to 1872?—Perhaps if I gave you the actual number of vaccinations that were paid for in those periods it would clear up that point. For the period 1868 to 1872 there were 17,728 vaccinations paid for, in the following period there were 18,062; and although the actual number is slightly higher, the proportion, taking the increase of population, or relating the vaccination to the births, is, of course, considerably lower for the years 1873 to 1877, so that the highest period for the vaccination rate is 1868–72.

17,008. Those are public vaccinations?—Those are the numbers for which the Vaccination Officer received his fees, and they include private as well as public vaccinations.

17,009. (*Dr. Collins.*) When was the payment made; within a short time of the close of the year 1872?—Yes, within a short time of the close of 1872. It is possible they might not all have been paid for exactly year by year, but those are the actual numbers that he was paid for during those years.

17,010. (*Sir William Savory.*) Can you give the Commission in those five years, 1868 to 1872, the number of vaccinations in each year?—Do you mean in regard to the births or the actual number that took place in those years?

17,011. You have a total of so many vaccinations in five years, have you not?—Yes.

17,012. Can you divide that total number amongst the five years?—Yes, I can.

17,013. Could you also divide the death-rate from those zymotic diseases amongst the five years?—Yes. That you will find has been divided and set forth in the previous table I have handed in, namely Table I.

17,014. But I wanted to make a comparison between the number of vaccinations for each of those five years, and the death-rate from the zymotic diseases for each of the five years: I have an average here of the five years, but it would be more satisfactory if they were divided up into separate years?—I have already supplied that information to the Commission. You have them split up into separate years in Table 19.

17,015. But have you the vaccinations?—Yes, you already have the vaccination per-centage to the births in the last column of Table 19.

17,016. I think it ought to be set out; it would be more important to have a yearly record than a five years' record?—But I have already set it out in Table

19. In Table 19, as I explained, you have the total deaths from the seven principal zymotic diseases which for 1868 are 7,884 per million, and the vaccination per-centage is 94.4; in the following year 1869 you get a total for that year of 5,104 per million zymotic deaths and a vaccination per-centage of 94.7; in 1870 the total zymotic death rate per million was 7,248 and the vaccination per-centage 81.7.

17,017. But they bear a very different proportion; the proportion is nothing like uniform there?—I believe the proportions would be about the same if we took the official instead of the actual number of vaccinations that were performed, if this is what you are referring to.

17,018. As a matter of fact, the vaccinations in those five years vary widely, but, as shown in the five year periods, they appear to be throughout proportionate to the number of deaths. When you come to analyse the different years you see that they are not proportionate?—I cannot see that the annual table teaches us anything different from the quinquennial table.\*

17,019. In the first year, 1868, the zymotic death-rate per million living is 7,884, while the per-centage of vaccinations to births is 94.2; in the next, 1869, the death-rate has fallen to 5,104, while the vaccinations are slightly higher than before, namely, 94.7; in the next year, 1870, the death-rate has risen to 7,248, while the vaccinations have fallen to 81.7?—It is not much below the previous number of vaccinations.

17,020. At all events the proportion is not maintained there?—I think in connexion with that you should take the year 1871, and connect that with 1870.

17,021. (*Dr. Collins.*) Unless vaccination were claimed to be the only cause of the rise and fall of zymotic diseases, you would not expect them to be uniform with the vaccinations, would you?—I have not said that I do expect them to be uniform, especially year by year.

17,022. (*Sir William Savory.*) Your Diagram G. would seem to show in a glaring sort of way that vaccination is the sole cause. There is nothing said about any qualifying causes elsewhere, but that there is a certain relation to be observed between vaccination and the amount of mortality, whereas, when you go to analyse it year by year, you see that that is not borne out?—I think it is fully borne out. This is an inquiry into vaccination, and therefore I show the connexion with our mortality. I might have shown other causes if it had been an inquiry into those other causes.

17,023. It would have been fairer to have set the figures out year by year?—I submit, with the greatest respect, that I have already set my figures out year by year.

17,024. (*Dr. Collins.*) Do you anywhere suggest that vaccination is the sole cause of the rise and fall of zymotic diseases?—Certainly not.

17,025. (*Sir William Savory.*) That is suggested not upon this table?—Certainly not. This is an inquiry into vaccination, and therefore I need not tabulate any other cause than vaccination. If I had done that which you are suggesting, I should have been met with the observation that the Commission must have something left to exercise their intelligence upon.

17,026. (*Mr. Picton.*) Is it your point that taking a sufficient period of time vaccination would be found to have had a certain marked influence amongst other influences in producing liability to zymotic diseases?—Yes; if you take a sufficient period.

17,027. But you do not maintain that you can trace it exactly from year to year, and say that so many more vaccinations mean so many more deaths from zymotic disease in each particular year?—I have desired to avoid that conclusion by handing in my quinquennial tables, otherwise it might have been thought that I had selected years that told in my favour, and left the others out.

17,028. (*Mr. Bright.*) For this reason you have put it in five year periods to average the thing more fairly?—Yes, to average the thing more fairly, and to show a general comparison with average results, rather than particular years. I do not know how I could possibly have put it more fairly.

\* Supposing the health of a child to have been fatally injured by vaccination late in 1868, it does not necessarily follow that the child must die before 1869: so that a quinquennial period gives a juster view of the probable connexion between vaccination and the death-rate than is shown by an annual table alone.—J. T. B.

Adjourned till Wednesday next at 1 o'clock.



## Seventy-first Day.

Wednesday, 1st July 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir EDWIN HENRY GALSORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.

Dr. WILLIAM JOB COLLINS.  
Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. SAMUEL WHITEREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

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17,029. (*Chairman*.) You had agreed on a previous occasion that certain corrections were required to be made in your Diagram A. to bring it into strict accord with the real statistics?—To what part of the diagram are you alluding, may I ask?

17,030. The vaccinations, for example?—The vaccinations may require some corrections, or rather, redistribution and addition.

17,031. Those corrections have not been made in your Diagram G., illustrating Table 20, have they?—Not at present in Diagram G.

17,032. So that if they are made in the one in order to bring about complete accuracy some modifications would have to be made in Diagram G., illustrating Table 20?—Yes, the redistributions would affect the earlier periods principally, but I do not think the period 1868–72 would be relatively altered very much.

17,033. Would it not?—I think not. From my investigation up to the present I find it will be raised even higher, taking the actual number of vaccinations which were paid for annually.

17,034. Have you not included in that period certain extra vaccinations which you have not included in other periods?—I would rather, if you would allow me, enter into that question another day, when I purpose dealing with it fully.

17,035. Very well. Then what is the next matter to which you wish to-day to direct the attention of the Commission?—At the last sitting I was dealing with Diagram G., and I will continue what I have to say upon that. In 1868–72, the highest vaccination period, small-pox mortality was 384 per million above the periodic average death-rate from that disease, in Leicester.

17,036. You say, “the highest vaccination period;” was not that vaccination period almost exactly of the same height as the period 1873–77 and the period 1853–57 if it is properly corrected?—No, decidedly not. The period 1853–57 would be very much lower.

17,037. Say 1873–77?—The period 1873–77 is also lower than 1868–72.

17,038. I ask, if it is corrected between 1868 and 1872, would not it be very nearly the same as from 1873 to 1877?—No, I think not. In fact the respective positions will not be altered very much. The revision I find will be in the direction of still further raising the vaccination rates for 1868–72 above those of 1873–77, the period to which your Lordship alludes. The period 1873–77 having already been prepared according to the returns which have been sent to the Local Government Board, requires little or no alteration. Continuing my statement respecting Table 20 and Diagram G., you will find that the death-rate from measles in the period of 1868–72 exceeds the periodic average by 175 per million.

17,039. What do you mean by the “periodic average”?—The periodic average is the average of the eleven periods shown in the table and diagram.

Scarlet fever in the same period 1868–72 exceeds the periodic average death-rate by 191 per million; diphtheria exceeds its periodic average death-rate by 18 per million, while whooping cough is 14 per million below its average, and fevers are 135 per million below their periodic average; but diarrhoea, the most fatal scourge of Leicester, is for 1868–72, enormously above its periodic average death-rate, exceeding it by 1,106 per million. Diarrhoea is also 654 per million above the death-rate of the next highest period shown on Table 20; proving to my mind that there was some specific cause which produced this extra loss of life in the highest vaccination period of 1868–72.

17,040. Perhaps the same cause which produced the excessive small-pox in those years produced the excess in other diseases?—Perhaps so, there might have been some other contributory causes, but I am not aware of any which could be of such general application as vaccination.

17,041. (*Sir Charles Dalrymple*.) What other causes do you refer to?—We have found in Leicester that excessive heat appears to be a contributory cause to our high mortality from diarrhoea.

17,042. (*Chairman*.) Do you think the vaccination is a contributory cause to the high mortality from small-pox?—I think it must have been, as proved by my tables. In respect to diarrhoea, it has been found in Leicester that when we have had excessive heat we have experienced a higher mortality from diarrhoea, and to modify this the Corporation have to some extent introduced a system of watering the streets at such times with disinfectants. But the watering of the streets in the ordinary way has apparently been found to be equally effective in controlling the mortality from that disease.

17,043. But supposing that vaccination had, as you suggest, a possible connexion with the large number of deaths from any disease, take small-pox to begin with, would you not have expected not to find a large number of deaths in a single year producing the heavy average for the five years, but a large number of deaths in each of the years, if vaccination was equally prevalent in each of them, or nearly as prevalent in the one as in the other?—Not unless vaccination were the only cause of that one disease.

17,044. But in 1872 you had 346 deaths from small-pox; the amount of vaccination in 1873 was as great, was it not, as the amount of vaccination in 1872?—It might have been nearly as high, but I have not the exact figures with me at present.

17,045. Upon that theory why should there have been 346 deaths in 1872, only 2 in 1873, and none in 1874, if vaccination had been a contributory cause and had been equally prevalent in each year?—Because, whatever the vaccinations were, the epidemic had then spent itself. We find, especially from Diagram B. which I put in nearly three months ago, that small-pox was epidemic at various times in Leicester, recurring every 4 or 5 years; and that when it has been epidemic



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it has generally been exceedingly fatal during its prevalence, but as soon as the fuel, so to speak, was consumed, the disease disappeared for two or three years.

17,046. Let us take scarlet fever upon that theory again. In 1870 and in 1871 was the amount of vaccination substantially greater than in 1872 and 1873?—Not substantially so, it was about the same.

17,047. Then if the vaccination had anything to do with scarlet fever how do you account for it that in 1870 there were 263 deaths; in 1871 there were 112; in 1872 only five deaths; and in 1873 only six deaths. Why, if the cause was constant, should not the deaths have been more or less constant throughout the period instead of grouping themselves only into those two years?—I think you are speaking of one cause only. However, the deaths are more or less constant; not in any specific disease, but in the kindred group of zymotic diseases you will find they are.

17,048. I am speaking of a specific disease. Do you or do you not suggest a connexion between the high rate of vaccination and scarlet fever?—Yes, I do, and also a connexion with the high zymotic death-rate generally.

17,049. You suggest a connexion between the high rate of vaccination and the large death-rate from scarlet fever?—Yes; but not that vaccination is the only cause. What I suggest is that vaccination lowers the stamina more particularly of the infantile population, and that they are, therefore, less able to resist any epidemic which may be prevalent at the time. The epidemic might be scarlet fever, or it might be small-pox, or it might be measles. The zymotic current varies.

17,050. (*Dr. Collins.*) You put it as one contributory cause, but not the cause?—Not the sole cause, but a contributory cause.

17,051. (*Chairman.*) For 1863, and for some years preceding it, the rate of vaccination had not been very high, had it; at all events not so high as about the years 1871, 1872, and 1873?—No, it was considerably lower in the earlier period you name.

17,052. Yet in the year 1863 you find 236 deaths from scarlet fever, whereas in 1870 you find only 363, with a considerably increased population. Was not the 236 a larger death-rate per million than that of 1870?—Yes, it exceeds the death-rate per million of 1870.

17,053. It exceeds any death-rate per million which has ever been attained since then, does it not?—Yes, it does for that one disease.

17,054. Therefore in a period when vaccination was less than it was in subsequent years you had a higher death-rate from scarlet fever than you ever had during the highest period of vaccination?—Yes, for that one year, not for a "period." But on the other hand, we had a very high death-rate from scarlet fever in 1870–71 when vaccination was very high, especially in 1870, a death-rate which has not been equalled since; in fact not approached in intensity since the decline of vaccination.

17,055. But it had been equalled before?—Yes, but only in the single year mentioned, when we had some of the extra vaccinations, and during the whole of the later period sanitation was making great progress, and measures were being introduced into Leicester which would to some extent control the general causes of scarlet fever.

17,056. Taking the year 1867, the year 1867 exceeded the rate very much which you had in 1873 or 1874 or in 1877 or in 1878, which is a high vaccination period?—But your Lordship has passed over the high scarlet fever death-rate of 1875 and 1876. I have never attempted to show that the death-rate of any specific year is absolutely and solely due to this one cause, vaccination.

17,057. I do not say that you have attempted to show that, but if you say it influences it, would you not expect first of all to find a higher death-rate at the time when your vaccination was more than you would expect to find at the date when your vaccination was less, if vaccination was one of the causes?—Yes, if all the other causes were operating in the same direction and at the same time. What we have actually found is this, that in the group of zymotic diseases the whole mortality is considerably higher, when we have the highest rate of vaccination.

17,058. And you do not think it is of importance to see how it affects particular diseases or how the number of deaths are distributed, whether they come very much in a particular year or years, or are spread broadly over the various epochs?—For the reasons I have already given, I do not think it of so much importance as the consideration of the general zymotic death rate grouped together in five-year periods.

17,059. You consider it of some importance?—It has its importance no doubt.

17,060. However, you have not taken it into consideration?—I have taken it into consideration to the extent that I have prepared the whole of my tables of mortality on an annual, as well as a quinquennial basis, so that the Commission can see the exact death-rate for each disease, and the death-rate for each year.

17,061. (*Sir James Paget.*) Have you compared the condition of Leicester in those respects with that of other large towns in England?—With regard to the death-rate from zymotic causes, I have compared it with the towns I mentioned on the last occasion.

17,062. Have you found in the towns where vaccination is continued to be largely practised that the mortality from zymotic disease has or has not diminished in the same degree as in Leicester?—I do not think it has diminished to the same extent.

17,063. Have you looked through the records of these towns?—I have looked through the statistics relating to a number of them.

17,064. Could you tell the Commission in which it has not diminished?—In London it has not diminished so considerably as it has in Leicester, and the same applies to Sheffield.

17,065. What is the amount of diminution in London?—The rate of diminution in London as compared with the figures in my Table 20 for Leicester is as follows. The death-rate in Leicester for the total of the seven principal zymotic diseases for the period 1868–72, was 6,852 per million, and in London it was 5,128, taking the Registrar-General's returns. Then in 1888–89 the death-rate for the same diseases in Leicester was 2,379 per million, and the death-rate for London was 2,390, so that the fall is from 6,852 in Leicester to 2,379, and in London from 5,128 to 2,390, being for Leicester a fall of 4,473 per million, while for London the fall was only 2,738, or 1,735 per million per annum in favour of Leicester.

17,066. That is for only one year in London?—No, it is on the average death-rate for the five years 1868 to 1872, just as I have taken it in Table 20 for Leicester.

17,067. You have taken it in the same way for London?—Yes, for the same years for London.

17,068. (*Chairman.*) Your first figure is a five years' average; what is the second?—An average for the two years 1888–89; but if you would prefer to have the five previous years which is perhaps the best comparison I could give you, then the average annual zymotic death-rate in Leicester for 1868–72 was 6,852 per million and for the five years 1883–87 the death-rate was 3,191 per million. For London the average annual zymotic death-rate for 1868–72 was 5,128 per million in the first period and 3,002 in the last.

17,069. (*Sir James Paget.*) That is very nearly the same fall as in Leicester, is it not?—It is not nearly so much, because in the first period Leicester is 6,852, as against 5,128 for London; while Leicester mortality falls to 3,191 and London to 3,002, being a decline in the annual zymotic mortality for Leicester of 3,661 per million, while for London it is only a decline of 2,126, or 1,535 per million per annum in favour of Leicester.

17,070. (*Dr. Bristowe.*) How much does diarrhoea contribute to the mortality of each case?—Diarrhoea contributes to the mortality of Leicester 3,161 per million per annum in the former period, 1868–72, and declines to 1,734 in the period of 1883–87.

17,071. And in London?—In London the average annual diarrhoeal mortality is 1,248 per million in the earlier period and 862 in the last.

17,072. (*Chairman.*) Then if you were to exclude diarrhoea, London has diminished in regard to the other zymotic diseases a good deal, has it not?—It appears to have done so. Of course if we ignore important factors it will materially alter the comparison.

17,073. And in Leicester in the earlier period the diarrhoea mortality was something quite abnormal as



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compared to all other parts of the country, was it not?—It always has been. I do not know that there is any difference now. Our death-rate from diarrhoea is always great as compared with other zymotic diseases.

17,074. But where you would gain, you mean as compared with London, was in diminished diarrhoea, was it not?—Yes, that is an important gain, but not the only one. I was just looking casually at the figures, and I find our gain for small-pox is considerable as compared with London. I have here a diagram sketched with pen and ink which shows the relative proportions of the various zymotic diseases in Leicester, which the Commission might look at in connexion with Diagram G.

17,075. If you have a specially unhealthy town, that is to say, unhealthy by reason of the prevalence of some particular disease, would you not expect, so far as diminution results from sanitary improvements, to find a greater relative diminution in the zymotic diseases in a specially unhealthy town than in a town that was not specially unhealthy, and which did not so much need sanitary improvements?—I do not know why the reduction should be more in the one prevailing disease than in the others, except the sanitary improvements are specially directed to combat that particular disease.

17,076. Suppose you have got your sanitation to the highest point that is possible in a particular town, and then you start sanitation in some other town which greatly needs sanitation, surely you would expect in the next five years to do more in the way of improvement with your sanitation in the town where you had done nothing hitherto than in the town where you had done less, because you required to do less, in the way of sanitary improvements?—Yes, certainly.

17,077. (Dr. Collins.) Was Leicester a specially unhealthy town with reference to zymotic diseases?—Yes, it was; especially from 1868-72, when the percentage of vaccination was highest.

17,078. How did it stand with reference to the total death-rate?—It was formerly always above the average of other towns. Taking the Registrar-General's returns, on an annual average of five years as before, I find that the death-rate for England and Wales in 1868-72 was 22·2 per 1,000, and for Leicester during that period it was 26·82, being a difference of 4·6 per 1,000 against Leicester.

17,079. But England and Wales, I apprehend, include all the agricultural districts?—Yes, they would.

17,080. Have you made a comparison with the other large towns?—No, not with all the other large towns.

17,081. Is it not a matter of common experience that the mortality of the agricultural districts is lower than that of the large towns?—Yes, it is much lower; but the death-rate of Leicester, which in past years considerably exceeded the death-rate of England and Wales, has now actually fallen below the death-rate of England and Wales, although the latter includes the rural death-rate.

17,082. Can you give me any figures to show that for the period from 1838 to the year 1868, Leicester, as judged by the total death-rate, stood badly in comparison with other large towns?—I can only give you a comparison between Leicester and the country generally.\*

17,083. Do not you think it might be important as bearing upon the question put by his Lordship to give that information?—No doubt it would, but I thought what I have already given is quite sufficient for our purpose.

17,084. (Chairman.) But as compared with London, how did it stand with reference to the general death rate?—I could not answer at the moment on the general death-rate, for London alone; but I have already given the figures for a comparison of their zymotic death-rates. These show that Leicester although formerly more unhealthy, is now healthier than London.

17,085. You were pointing out that the death-rate during those five years had not diminished in the same

proportion in London as it had in Leicester, the initial comparison between the two is a matter of some importance, is it not, in determining whether that indicates anything in support of your view?—Yes; it would be of some importance.

17,086. Take Norwich. I have here the figures given me for Norwich. In the period 1868-72, the totals are 5,639, and in the period 1883-87, 2,704?—I also have the figures here for Norwich; mine slightly differ from those you have quoted. For the former period, 1868-72, I have the figure as 5,658 average annual zymotic death-rate per million, and for the second period, 1883-87, I have the number 2,688 per million.

17,087. They are substantially alike, but that is a greater proportion of diminution, is it not?—Do you mean a greater proportion of diminution for Norwich as compared with Leicester?

17,088. Yes?—I think not, because in the first period we were 6,800 and in the last 3,200, practically. It is practically a diminution for Norwich of 3,000, but for Leicester of 3,700, being a greater diminution of the average annual zymotic death-rate by about 700 per million. I have here also the figures for Keighley.

17,089. (Sir James Paget.) But in Keighley they had diminished the vaccination, had they not?—Very considerably.

17,090. But I want for the purpose of comparison the diminution in the mortality from zymotic diseases in towns in which vaccination has been continued as compared with Leicester in which it has been diminished?—Sheffield is a town which I mentioned on the last occasion, and we might, perhaps, compare that.

17,091. Sheffield has had a great mortality from small-pox?—That is so, notwithstanding its continued practice of vaccination.

17,092. But we are speaking of other zymotic diseases as possibly affected by vaccination?—But the group of diseases just referred to by his Lordship included small-pox for Norwich. It included the whole group of the seven principal zymotic diseases.

17,093. But there has been no epidemic of small-pox there; Sheffield stands nearly alone, does it not, in regard to the great epidemic of small-pox which it had some few years ago?—Yes; but we have found in Leicester that when one zymotic disease has declined others have become more predominant.

17,094. But would it not be more fair to take a town in which there has been no distinct epidemic as in Sheffield?—I do not see how it could be more fair, I am perfectly willing to make any fair comparison, but I do not see why Sheffield should be excluded simply because it has proved to the world the failure of vaccination.

17,095. (Chairman.) But your point is that vaccination affects the mortality from other diseases than small-pox. To show that you would want to make a comparison between the mortality from diseases other than small-pox in places where vaccination has prevailed, as compared with Leicester where vaccination has ceased, would you not?—To do that we should have to eliminate small-pox from this list of diseases which appears to me to be unfair.

17,096. But practically speaking in Leicester and London there has not been during the latter period any small-pox?—Not very much in London, but still less in Leicester.

17,097. So little that it would not greatly affect your total of the deaths from all zymotic diseases?—Very little indeed in this particular instance.

17,098. (Sir James Paget.) And in all other towns in England, except Sheffield, would not the same thing hold good of the mortality from small-pox, measles, diarrhoea, and so on?—Yes, speaking generally.

17,099. Therefore any other town in England would be a better town to compare than Sheffield?—I have the rates for Brighton if you think that they would offer a fairer comparison. Leicester has recently been bracketed with Brighton as being one of the healthiest towns, therefore, perhaps, that comparison may be more acceptable. For Brighton the average annual death-rate for 1868-72 was 4,069 per million from the seven zymotic diseases, and for the period from 1883 to 1887 it was 1,904, that is a fall of about 2,100. So that even for Brighton it is not so great a proportion of fall as that for Leicester. The fall for Leicester was more than 3,600; while that for Brighton is only about 2,100,

\* In 1838-42 the average annual death-rate from all causes for Leicester was 6·1 per 1,000 above that for England and Wales. It gradually fell to 2·6 above the general death-rate in 1855-62. But with increased vaccination in 1868-72 our death-rate rose to 4·6 above that for England and Wales; while for the last period it has fallen to 0·5 below the general death-rate, vaccination being abandoned. This means, as compared with the highest vaccination period, a saving of about 750 lives per annum on our present population. I cannot give any comparison with urban districts alone.—J. T. B.



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being a difference in favour of Leicester of 1,500 per million per annum.

17,100. (*Chairman.*) But if a place which is a very healthy place very largely diminishes its death-rate, you do not mean to suggest that the fact that a very unhealthy place diminishes its death-rate in even a greater proportion shows that there must have been some other cause for it than sanitation?—My principal object is to show that by our sanitary improvements in Leicester we have largely improved our health in regard to zymotic diseases and especially in regard to small-pox.

17,101. I thought your point was that by giving up vaccination you had done so?—I regard vaccination as one of the contributory insanitary causes, and its cessation has undoubtedly tended to lessen our death-rate.

17,102. I thought your point was that you had done so a great deal more than places that had not given up vaccination?—But would you kindly suggest a more crucial test that we could possibly apply to Leicester than by comparing it with Brighton, because if Leicester is now a very healthy town, and Leicester has beaten Brighton in the race—

17,103. But how could you have beaten Brighton in the race, Leicester is not so healthy as Brighton now; your figures have come to 3,200 and Brighton to 1,900; I do not regard them as being upon a level?—But then in the period 1868-72 our average annual zymotic death-rate was 6,852 per million as against 2,379 for 1888-89, so that the health of Leicester has improved at a more rapid rate than that of Brighton.

17,104. Because you were then a very unhealthy place, and Brighton was a healthy place; the healthy place has not made itself healthier to the same extent as the unhealthy place has made itself healthier?—If we go back to another period, 1858-62, we had an average annual zymotic death-rate of 4,616 per million. At that time we were in a worse insanitary condition than in 1868-72, when vaccination reached its highest percentage, and when the death-rate also reaches its highest point, notwithstanding some improvement in sanitary matters.

17,105. (*Dr. Bristowe.*) Where was that?—In Leicester.

17,106. Notwithstanding your sanitation the death-rate from those causes increased?—Yes, the death-rate in those years increased.

17,107. (*Dr. Collins.*) I understand you are only dealing in these figures with diseases which are held to be largely preventible?—That is so.

17,108. (*Sir James Paget.*) But if diarrhoea was your chief source of mortality, that might be diminished although others might not be?—That is possible.

17,109. (*Chairman.*) Is not that what has happened, is not your relative superior diminution entirely due, and more than due, to the diminution in diarrhoea?—No, it is just the opposite; if you will kindly look at the sketch diagram I handed round, you will find the diminution is greater in the other zymotic diseases as compared with diarrhoea. I have not the table of figures before me, but you will find that the relative per-centage of diarrhoea is now 52, I am speaking now from the sketch diagram just handed over to your Lordship.

17,110. But I am talking of you as compared with other towns. I thought you gave me just now the extent to which your greater diminution was due to the diminution in diarrhoea. If you take diarrhoea out of that diminution has not London progressed more than Leicester in its diminution; that is the point we are on?—It appears to have done so; but at the same time diarrhoea now gives a larger per-centage in our zymotic mortality than it did at the time of which I was speaking.

17,111. But we are not on that, we are comparing the two periods of Leicester with the two periods of London?—I understood that you were comparing the period 1863-72, and stating that the then increased mortality was due to the larger proportion of deaths from diarrhoea, as compared with the diarrhoeal deaths of the later period.

17,112. No; that your larger mortality then was so largely due to diarrhoea that your reduction in zymotic

mortality is due to the great reduction in diarrhoea?—That is so to some extent.\*

17,112a. (*Dr. Collins.*) It has been put to you whether even now Leicester as compared with Brighton is not relatively unhealthy. May I ask if you have referred to page 51 of the report of the Medical Officer of Leicester for 1890, where, under the heading "Leicester compared with other towns," he says, "On comparing ourselves with other towns, and with the country at large, Leicester comes out very well. In the death-rates as recorded by the Registrar-General, Leicester is bracketed with Brighton—second on the list—with a rate of 17·8 per thousand, Nottingham being first with 16·5, whilst it mounts up to no less than 27·4 in Preston, and 30·6 in Manchester." Then he continues "If the infantile mortality of the borough, which is still excessively high, could but be permanently lowered, to the average of some other manufacturing towns, Leicester would have no difficulty in taking the first place upon the urban health-roll of the country. When we come to speak of the infantile mortality of the past year, it will be found there is a slight improvement to record with respect to this, the one weak spot in our mortal statistics."?—Yes, I have read that, and I am glad to find that the opinion of our Medical Officer of Health emphasises the evidence I have now given.

17,113. (*Mr. Meadows White.*) In the vaccination age you contrast unfavourably with other towns?—If you are referring to our infantile mortality, we have experienced a considerable diminution even in that as I shall show further on.

17,114. But in infant mortality you contrast unfavourably with other towns, although in older mortality you contrast favourably?—I should judge that we have in the past compared more unfavourably for the higher ages. Our death-rate for 1889 was only 16·6 per 1,000.

(*Chairman.*) But that is only a year's comparison, which is not the best basis to make the comparison upon.

17,115. (*Dr. Collins.*) Then I will ask your attention to the figures upon page 50 of the Leicester Medical Officer of Health's report for 1890, in which the total death-rate for Leicester is given as 19·4 in 1885; 19·6 in 1886; 19·0 in 1887; 17·9 in 1888; 16·7 in 1889, and 17·8 in 1890?—Yes, those figures compare very favourably with the figures for the 28 large towns; our death rate is now below theirs.

17,116. (*Dr. Bristowe.*) I wish to ask you if the census returns for this year agree with the calculation of the population by the Medical Officer of Health upon which that was based?—I think they do not, but the same observation applies to all the other large towns as well as to Leicester.

17,117. How does it apply to Leicester, has the population increased at the rate at which the Medical Officer assumed it to increase?—It has not increased at the rate at which the Registrar-General has assumed it to increase.

17,118. But the Medical Officer no doubt takes the data of the Registrar-General?—Yes, he does.

17,119. What is the actual population of Leicester as ascertained by the last census?—Within the present borough boundaries it was 142,000 odd.

17,120. What did the Medical Officer of Health take the population to be in 1890?—I think he took it to be about 154,000, I am not quite sure as to the exact figures.

17,121. (*Dr. Collins.*) The experience of Leicester in finding its actual census figures less than those which had been calculated is not unique at all, is it?—No, not at all, it is borne out by the experience of many other towns.

17,122. (*Chairman.*) But when you are dealing with a comparison with other towns you must find out whether that is borne out or not before you can tell whether your comparison is worth anything?—It might be borne out to a less extent in one town than another, but it is the general experience that the population has been over estimated.

\* My Table 20 proves that there has been a greater relative reduction in the other zymotic diseases, because out of every 100 zymotic deaths in 1883-87, no fewer than 54·4 were due to diarrhoea, whereas in 1888-72 there were only 46 per cent. This increase in the per-centage of diarrhoea to the extent of more than 8 per cent. is due not to an increase in the actual number of deaths from diarrhoea, but to the fact of a more rapid decline in the other zymotic diseases especially small-pox.—J. T. B.



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17,123. (*Dr. Collins.*) Is it not equally clear that the estimates for most other towns are wrong?—I understand so; there has been a general over estimate of population I believe all round, therefore to make an equal comparison we must take the figures of the Registrar-General as they stand.

17,124. (*Dr. Bristowe.*) In some places there has been an under estimate and in some an over estimate?—Yes. Take Cardiff, for instance, that has been considered to be a very unhealthy town, because its population has been greatly under estimated. This would have the effect of raising the figures for the death-rate. But it has now been found to have considerably exceeded the estimated population. However, I do not know that Leicester is very different from other towns generally in regard to the over estimate of population. But of this I have made no comparison.

17,125. Do you know how much Brighton was over estimated?—I really do not know.

17,126. (*Sir James Paget.*) Do you know in what diseases the diminished mortality of Leicester has lately most strongly shown itself?—The principal decline is in zymotic diseases other than diarrhoea. There has been a greater decline in all other zymotic diseases than in diarrhoea, excepting diphtheria, which appears to remain stationary.

17,127. There has been a great diminution, has there not, in scarlet fever?—Yes, there has been a great diminution in scarlet fever.

17,128. Could you tell at all what proportion of the total diminution is due to scarlet fever?—If you will kindly look at Table 20 the proportions are all set out there, with the per-centage rates and the rates per million. Scarlet fever for the last two years is only 1·4 to every 100 of the deaths from the seven principal zymotic causes, measles is 19·7, diphtheria 3·3, whooping cough 16·0, the group of common fevers 7·6, and diarrhoea 12·0. In 1868-72 the per-centage of scarlet fever was 52·5, showing now a diminution of 11·1.

17,129. (*Dr. Collins.*) I should be much obliged if you would kindly give me the figures you have calculated for Sheffield for those two periods?—For Sheffield, the average annual death-rate from the seven principal zymotics, during 1868-72, was 7,398 per million, while for Leicester during the same period, the death-rate was 6,852 per million; and for 1883-87, Leicester is 3,191 and Sheffield 3,595 per million. Sheffield, I might observe, should, considering its geographical\* position, be a much healthier town than Leicester.

17,130. In the latter period should I be right in saying that the death-rate from the seven zymotic diseases is higher in Sheffield than it is in Leicester?—Yes, considerably higher.†

17,131. (*Sir James Paget.*) But in regard to that point of view that that mainly shows the influence of vaccination, if that is so Sheffield has been largely vaccinated and re-vaccinated since the epidemic of small-pox, has it not?—I believe the vaccination of Sheffield has been kept up to about the same high per-centage all through.

17,132. (*Chairman.*) Did not the epidemic there, as generally, induce a good deal of vaccination?—It did so according to the Sheffield report of Dr. Barry.

17,133. (*Dr. Collins.*) Would the epidemic come into the period 1883-87?—Only some part of it. The small-pox death-rate in Sheffield for 1887 was 880 per million, and for 1888 it rose to 1,270. The average annual zymotic death-rate for Sheffield in 1888-89, is slightly lower than its death-rate for 1883-87, falling from 3,595 per million to 3,425; that is about 170 per million, but our Leicester death-rate fell about 700 per million in the same time.

17,134. (*Sir James Paget.*) Can we from the figures at all estimate what you believe to be shown, namely, that vaccination has a distinct influence in causing deaths from zymotic disease?—I think so, because Leicester, which has in the past been described by the

Registrar-General as being a very unhealthy town, has now taken its rank amongst the healthy towns.

17,135. But taking a single case as regards the influence of vaccination in inducing the existence of zymotic disease, can you show any town in which vaccination is still continuing where there is a much less diminution in zymotic disease than in Leicester?—I think not, because the figures show that there is much less diminution in the two other towns that we have already dealt with than there has been in Leicester.

17,136. That you ascribe to vaccination rather than to any other possible cause?—Some part of it.

17,137. Taking Sheffield, where this epidemic so largely prevailed in 1887 (because the year 1887 includes the first year of it), and was the cause of 280 deaths out of a total of about 1,350 deaths from zymotic diseases, you do not suggest that vaccination in Sheffield produced or encouraged small-pox, do you?—The Registrar-General gives 278 small-pox deaths for Sheffield in 1887, and 408 for 1888. I do not suggest that vaccination produced the epidemic, but I do suggest that vaccination encouraged it, and that the vaccination of infants lowers their vitality so that they are more liable to become a prey to any epidemic which may occur.

17,138. There may have been some increase of small-pox deaths, but if you exclude small-pox, which would not be one of the diseases you would anticipate to be directly affected by vaccination in the way of producing death, would not Sheffield be shown to have a diminution of zymotic disease largely exceeding that which you have had in Leicester?—No, even if we exclude small-pox it would not. But whether it were so or otherwise, I think it would be most unfair to exclude such a factor, because the calculations tell in favour of Leicester. We might on the same assumption exclude diarrhoea from the Leicester figures, but such a proceeding would be unwarrantable and unstatistical.

17,139. (*Dr. Collins.*) If you deduct the deaths from small-pox which occurred in Sheffield in 1887 would the latter period of 1883-87 for Sheffield, as compared with the same period for Leicester, as regards the other zymotic diseases, show a greater prevalence of the other zymotic diseases in Sheffield than in Leicester?—Yes, it would show a greater prevalence of the other zymotic diseases in Sheffield than in Leicester; the difference is this, that in Sheffield, excluding the death-rate per million for small-pox, the death-rate per million from other zymotic diseases would be 3,390; and excluding the 4 per million for Leicester (the rate which prevailed during the same period) our death-rate for the other zymotic diseases would be 3,187 per million or a difference of 203 per million per annum in favour of Leicester. But if we exclude the small-pox deaths from both towns, and then compare the death-rates from the remaining six zymotics, for the periods 1868-72 and 1888-89 the difference is still more in favour of Leicester. The fall for Sheffield being 3,323 and that for Leicester 3,700; or 377 per million per annum in favour of Leicester.

17,140. Now, would you oblige me with the figures for Keighley?—For Keighley the average annual death-rate per million from the seven principal zymotic diseases for 1868-72 was 5,666, and for 1883-87 it was only 1,715, showing a still greater decline even than Leicester.

17,141. (*Mr. Meadows White.*) Has Keighley had the same sanitary discipline as Leicester; has it made improvements in sewers and other things?—I could not answer as to its sanitary arrangements, but it abandoned vaccination at an earlier date even than Leicester. Keighley includes three or four townships, and is of a more rural character than Leicester.

17,142. (*Chairman.*) What is the population?—I think I stated it to be about 61,000 for the whole district. It is a group of places comprising Keighley, Bingley, and Haworth; Keighley itself is a small place of about 30,000.

17,143. But when we hear of the abandonment of vaccination in Keighley, does that extend to the whole Keighley district?—Not so largely as to Keighley proper, but it does affect the district altogether, that is to say, the district of Keighley, Bingley, and Haworth. The opposition there to vaccination has been very strong.

17,144. But does the diminished death-rate you give for Keighley relate to the whole district of Keighley?—It embraces the whole district of Keighley; the registration district taken from the Registrar-General's returns,

\* The figures given by me show that the per-centage of diminution for Leicester exceeds that of Sheffield by 3·6, or a greater saving of life (by a diminished death-rate) than Sheffield of about 140 per million. If the last two years, 1888-89, were taken, they would show a still greater gain for Leicester.—J. T. B.

† The average annual zymotic death-rate in Sheffield, for 1888-89, was 3,425 per million, and that of Leicester 2,379, a difference of 1,046 per million in favour of Leicester. Whereas in the earlier or initial period, 1868-72, the difference in favour of Leicester was only 546, so that we have nearly doubled our improvement on Sheffield.—J. T. B.



17,145. (*Dr. Collins.*) Will you tell me from what year the decline of vaccination in Keighley commenced?—The decline of vaccination in Keighley commenced at an earlier period than in Leicester. A return that was sent from the Local Government Board to Mr. Milner, of Keighley, giving the comparison between the Unions of London, Keighley, Leicester, and Dewsbury, in reference to the per-centage of cases of vaccination finally unaccounted for, showed in 1874, for Leicester only 2·8; while for Keighley it was 49·9. The rate goes on gradually increasing in Leicester to 1881, when it reaches 22·8 unaccounted for, and in the same year (1881) for Keighley the per-centage unaccounted for is 62·4.

17,146. (*Chairman.*) Keighley already in 1874 had 49 per cent. unaccounted for apparently, and therefore it had begun before that time; do you know if it affected the period of 1868–72?—I think not.

17,147. Then it all started up between 1872 and 1874?—I know the movement against vaccination reached a considerable head much earlier in Keighley than it did in Leicester; I could not give you the exact year of its commencement.

17,148. (*Dr. Collins.*) I suppose you would not dispute that even now with vaccination practically abandoned in Leicester, Leicester has an exceptionally high infantile death-rate?—No, infantile diarrhoea is the principal cause of our zymotic mortality. What I mean is that apart from that we should have a much lower general mortality even than we have now.

17,149. Do I understand your general suggestion to be that with the superadded influence of vaccination it operates still more detrimentally upon your infant mortality, especially as regards zymotic diseases?—Yes; I know that the infant mortality was much higher during the most rigorous enforcement of vaccination than at any other period of the 52 years.

17,150. And that you are prepared to show?—Yes, I shall show that later on.

17,151. (*Chairman.*) What is the next point to which you wish to direct the attention of the Commission?—I should like to quote in this connexion an extract which I took from one of the Registrar-General's reports; I believe it was the 20th annual report. At page 43 this observation is made. "Leicester is an unhealthy district; the average mortality is high, the average number of deaths in the summer quarter is 325; in the last quarter no less than 457 deaths were registered. The registrar of the east district remarks, 'since that time'—this is referring to 1840—"vaccination 'seems to have been totally neglected, hence the 'great increase of deaths for this and the preceding 'quarter.' This is the observation of the registrar, and he goes on to say that during the year 1845 there was a great small-pox epidemic in Leicester. He then remarks "I have registered 73 deaths from natural small-pox"; and he gives this fact as accounting for the high mortality.

17,152. (*Sir James Paget.*) You have not looked through the rest of the towns beyond those you mentioned last week to see if there be a distinctly diminished mortality in the cases where vaccination has continued; have you taken Hull into account?—I have not.

17,153. Nor Bristol?—No.

17,154. (*Dr. Collins.*) It has been put to you whether you consider it to be of any importance at all to trace year by year the relation of vaccination to the various zymotic diseases in Leicester; am I right in saying that except for the information you have placed before the Commission there has not been hitherto an opportunity of making such a comparison?—There has been no such opportunity at all, as that which I have given to the Commission.

17,155. (*Sir James Paget.*) Have you made any comparison of foreign countries where vaccination is compulsory with those in which it is not?—I have not.

17,156. As to the occurrence of other zymotic diseases?—No, I have confined myself almost solely to the zymotic diseases as they affect Leicester in making the comparisons with other towns I mentioned to-day, and besides these I have made one or two comparisons with the country at large.

17,157. Is not the only complete test that could be made the test of difference between places that are and places that are not vaccinated?—The wider the survey you can take the better for general purposes; but I

think that for the special object we have now in view making a comparison between one English town and several others as I have done to-day is sufficient; it is for my purpose at any rate.

17,158. You have not mentioned the several English towns?—I have mentioned and made comparisons for Keighley, London, Brighton, Sheffield, and Norwich, which you have had to-day.

17,159. Norwich has practically the same proportionate decline as Leicester. Taking your own figures, given at Question 17,086, the decline for the periods compared was at Norwich 52 per cent. and at Leicester 53 per cent. But I suppose we may gather that you cannot make any estimate numerically of the influence of vaccination upon zymotic diseases?—No. We cannot, perhaps, give an absolute numerical estimate of the detrimental influence from vaccination alone, but I can give the numerical saving of life between the period when vaccination was highest and the period when it has considerably declined, which is, I think, equally important.

17,160. But do not your own numbers show that there has been a great diminution in the mortality from zymotic diseases, even where vaccination has been continued?—Yes, but it has still been greater in Leicester.

17,161. Not than in all?—In most of the comparisons we have made.

17,162. How many of the 28 great towns have you tested?—Those I have mentioned to-day.

17,163. That is four, and in one of those the diminution is greater than in Leicester?—Was that Brighton?

17,164. No, Sheffield; in Brighton it was less?—I am not aware that the diminution was greater in Sheffield than in Leicester.

17,165. Was not that what we just now reckoned?—Excluding small-pox for Sheffield?

17,166. No, including small-pox; and Norwich is less?—No. The rate of diminution is not so great for either Norwich or Sheffield as for Leicester.

17,167. Yes, I think it is?—Leicester and Sheffield we did not fully compare for the last period on my Table 20.

17,168. (*Dr. Collins.*) I understood that in Norwich the decline was less, and that in Sheffield it was greater?—In Sheffield the figure for the decline is greater, but on calculation it will be found that the proportionate or per-centage decline is less.

17,169. (*Sir James Paget.*) But still the contrast remains; in the one case vaccination has practically ceased, in the other it has continued; there is a great contrast in respect to that, but in regard to the mortality from zymotic diseases the contrast is very small. If you compare the diminution of vaccination in Leicester with its continuance in the other large towns, and then compare the diminished mortality from zymotic diseases in Leicester with the diminution in the several other large towns, the one diminution is very great and the other very small, is not that so?—There is a difference, even for these towns, in favour of Leicester. I believe as compared with the whole country it would be found that the zymotic death rate for Leicester had diminished considerably more than that for the country generally.

17,170. But would it have diminished in anything like the same degree as the diminution of vaccination?—No, I have already said so several times, because the effect of the removal of only one factor, or cause, of a death-rate cannot possibly be expected to equal the effect which would be produced by the removal of all the factors, or causes, of that death-rate.

17,171. Then how can you estimate the influence of vaccination when you have so many other influences at work?—I can; as I have already shown that vaccination has had a detrimental influence in raising our death-rate.

17,172. It would be very difficult to estimate the influence of vaccination exactly?—Yes, to estimate it mathematically. The influence of vaccination I have cited as only one amongst other causes.

17,173. Does it come to more than a guess?—I think it does, because we have seen its effects.

17,174. Upon what ground do you say that?—Upon the ground of our experience in Leicester; and I do not

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know that our experience in Leicester is contradicted by the experience of other towns.

17,175. In other towns they have continued to vaccinate, yet they have a very large diminution of zymotic diseases?—But they have never been so subject to zymotic diseases as we have in Leicester.

17,176. Why not?—Comparing Sheffield with Leicester, the average annual zymotic death-rate, taking the returns for the last period, 1888–89, is still 3,425 per million, and ours is only 2,304 or a difference in favour of Leicester of 1,121 per million.

17,177. That is a different estimate from what you stated before?—Yes, I am now taking the two last years, 1888–89.

17,178. Do you think those are fair to judge from, seeing the variations in zymotic diseases for successive years?—I think so, inasmuch as this proportion is borne out by three years out of five, and I compare them with the same years for Sheffield.

17,179. Surely you yourself said that five years was the least you could rest fairly upon?—Wherever possible I have taken it upon five years, but for the last two years I could not do so without overlapping the previous period with which I have already dealt.

17,180. Taking the variations of Leicester at different times, I see that in 1885 the mortality from scarlet fever in Leicester was higher than in any other town?—In 1885 scarlet fever was high.

17,181. And in 1887–88 scarlet fever was very low?—But my Table 19 shows that even in 1885 scarlet fever is very little higher than in 1883, and is considerably lower than in 1881 and 1880.

17,182. But still it is in that year very high, and in 1887–88 it is very low, therefore it would not be fair to take 1887–88 as an estimate of the scarlet fever in Sheffield?—But I do not see why we should make the comparison for scarlet fever alone when there are other diseases to take into consideration.

17,183. Take any one of those diseases?—Taking the whole of this zymotic group the fall to 1889, as I have already shown, is greater in Leicester than in Sheffield.

17,184. Those two years may be chance years?—That might be so, but the observation applies alike to both towns, and to the years you yourself have quoted. Our low annual average zymotic death-rate for 1888–89 is fully borne out by the succeeding year 1890; and even up to the present, and we are half through this year, that is for three and a half years out of five, there is no material difference.

17,185. (Chairman.) In the period 1878–82 there was a large diminution of vaccination, was there not, as compared with 1873–77; it went down your table states from 80 to 66?—Yes.

17,186. Comparing the death-rate from the various zymotic diseases with a view to ascertain if the diminished vaccination had any effect upon the mortality, if you look at measles you will find that measles increased from 425 to 606 per million; there is no sign of diminution there; and scarlet fever from 765 to 820 in the quinquennium; there is no sign of diminution there; diphtheria increased from 78 to 92; whooping-cough shows a slight diminution; in diarrhoea there is a diminution from 2,500 to 1,900; the diminution is almost exclusively therefore in diarrhoea. Supposing therefore your view is correct that vaccination has an effect in increasing the deaths from those diseases which affect children, would you not have expected to find a diminution, not only in diarrhoea, but in measles and scarlet fever, instead of finding an increase?—Why, if it has the general effect upon the infantile constitution of rendering them more liable to die from diseases which affect children, why should that effect have only appeared in diarrhoea and not in measles and scarlet fever?—I am afraid that is a question I could not answer in the light of its effect upon any one specific disease; but taking the whole group and for a wider range of years there is a considerable decline from the one period to the other.

17,187. But if it has no effect upon a specific disease A., B., C., or D., it cannot have an effect upon A., plus B., or plus C.; it must have the effect of rendering a person liable to die of something, not of anything?—But we do show that there is a decline in our small-pox death-rate and whooping-cough, and in the group of fevers in addition to the great fall in the death-rate from diarrhoea, so that there is a fall in four diseases

out of the seven. And although one is partly balanced by another, on the whole the fall is considerable.

17,188. But if vaccination by weakening a child tends to make it more liable to die of scarlet fever, would you not expect to find in the course of years a diminution in the deaths from scarlet fever by reason of the diminution of vaccination if there were any such influence?—There is a considerable decline in scarlet fever as seen towards the end of our statistics.

17,189. But let us take those two periods in which there was a large decline of vaccination. In the case of vaccination the effect produced would be likely to be produced to a greater extent near the time of high vaccination?—Yes.

17,190. Therefore if you have a quinquennium with a largely diminished vaccination, if vaccination affects the liability of children to die of other diseases, ought not one to see the effect of this diminution within the quinquennium upon those diseases?—I think we should, and we certainly do. For when you refer me to the rise in the scarlet fever death-rate from 1873–77 to the following period 1878–82, why should we not equally refer to the next period, 1883–87, when the fall in the death-rate from this disease is from 820 to 464 per million.

17,191. Because if you have a constant cause you expect to find a constant result, and if you find the result not constant you are led to doubt if the presumed cause has led to the effect?—That is perfectly true; and I am perfectly willing to apply the argument to our total zymotic mortality. But I am not prepared to apply it to each specific disease as I have stated again and again.\*

17,192. In your view, if a child contracts disease and dies of the disease it is wholly immaterial to inquire into the effect of vaccination upon any particular disease, but only into its effect upon disease at large?—I do not say it is immaterial, but if a child die of the one disease which is prevalent, it is obvious that it cannot die of another. Besides it is often found that as one zymotic disease declines others rise, and *vice versa*.

17,193. That is not always true, is it?—It is not always true, but I have found that frequently as an epidemic of small-pox has declined its place has been taken by measles or by something else.

17,194. (Dr. Collins.) The contrast between the periods 1868–72 and 1873–77, as regards the amount of vaccination in either, is very much less, is it not, than it would be between 1868–72, and any of the subsequent periods, namely, 1878–82 or 1883–87?—Yes, the contrast for the amount of vaccination is very much less between 1868–72 and 1873–77 than it is between 1868–72 and any of the later periods to which you refer, and the decline of mortality is correspondingly greater in the later periods.

17,195. (Chairman.) The decline of 1873–77 as compared with 1878–82 is a much greater decline than between 1868–72 and 1873–77 in point of vaccination?—Yes.

17,196. (Dr. Collins.) I should like to put it to you broadly whether you do or do not allege that vaccination is the specific cause of any one or other of the seven zymotic diseases?—I do allege that it is an exciting cause of most of them.

17,197. Would it be more correct to put your view as being that it is a predisposing cause of any one of them rather than an exciting cause of any one of them, which represents your view the more correctly?—I believe it a predisposing cause more particularly. Perhaps the term “predisposing” would more accurately represent the facts of the case.

17,198. Should I correctly represent your view to be that although vaccination may not actually be the *vera causa* of any one or other of the zymotic diseases, yet that it may make children more likely to die of any zymotic disease which happens to be prevalent?—Yes, I believe that is the case. I have already expressed that as my opinion.

17,199. And while it might or might not be true that vaccination is a part cause, and possibly only a small part cause, there might be many other causes in opera-

\* In Leicester, as diarrhoea is the principal channel in which zymotic fatalities has run, it is chiefly to this disease we should look for the manifestation of any disturbing influence; and my tables prove that since the decline of vaccination, it is in this particular disease, we have experienced the greatest improvement in our zymotic death-rate.—J. T. B.



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tion, sometimes in opposite directions to that in which you allege vaccination to act?—Yes, I have no doubt of that. Our sanitary measures have to a large extent checked the evil influence of vaccination.

17,200. (*Mr. Meadows White.*) You found your conclusions upon the table of illustrations you have given the Commission?—Yes, I do, and I think the Leicester tables and diagrams bear out my contention.

17,201. (*Sir James Paget.*) And the few towns in which you have compared the effect of complete vaccination with the effect of nearly abolishing it as in Leicester?—Yes. But I also make a much broader comparison later on by comparing the total mortality of Leicester from all causes with that for the rest of the country generally.

17,202. Do you think that vaccination increases the probability of dying from whatever disease may prevail?—Yes, from any zymotic disease which may be prevalent, and especially for the younger ages. Investigation shows that our decline in mortality is due chiefly to a decline in the zymotic causes; because high as our infantile death-rate still remains, that decline is principally due to the decline of the zymotic death-rate for the younger ages.

17,203. Therefore?—Therefore the two effects namely, increased liability to zymotic diseases, and to death at a younger age, may both be produced by the predisposing cause of vaccination as illustrated by the tables and diagrams I have set before the Commission. We have never alleged that vaccination is as likely to influence adult life, but it does unquestionably influence infantile life, and as a matter of fact our saving of life since the decline of vaccination has been in that direction and in the zymotic diseases.

17,204. May we not reasonably ask for evidence which shows what are the conditions of the towns in which vaccination is still practised?—I have given that evidence to-day, and previously.

17,205. We have taken the case of six towns, and in two of them the decline of mortality from zymotic diseases has been as marked as in Leicester, namely, Norwich and Sheffield?—That is impossible in view of the figures for the respective towns. I think you must be mistaken respecting Norwich.

17,206. It is higher?—The actual figure is higher for Sheffield for one period only, but even for that, as well as for the other periods, the rate of decline is greater for Leicester, as it is also for all the six towns mentioned, excepting Keighley, which, if anything, has been a greater anti-vaccination centre even than Leicester. But both those towns you have mentioned, Norwich and Sheffield, geographically speaking, are in a much better position than Leicester.

17,207. Why should that affect them more since vaccination decreased in Leicester than it did previously to that time?—I do not know why the effect should be more, excepting this, that in a town already occupying a good geographical position the sanitary conditions applied to it, would be more likely to improve its health in a more rapid ratio than would be the case in a town like Leicester where there are enormous difficulties to contend with in regard to sanitation.

17,208. (*Chairman.*) Why should a town already healthy be able to improve more rapidly than an unhealthy town. I should have thought sanitary improvements would have operated more rapidly and extensively in the unhealthy town?—I did not mean my words necessarily to imply a "healthy" town, but a town occupying a healthier position from a geographical point of view. In the period we are speaking of 1868–72 all those towns show an unhealthy death-rate from zymotic causes, and a comparatively light death-rate at the present time. I do not think there is any diminution in their progressive improvement. Yet we have taken the period 1883–87 instead of the later one, which, I think is rather unfair as regards Leicester, because two of those towns, according to the statement made to the Commission, were in a healthy sanitary condition, whereas Leicester has not been so, and even now our sanitary condition is anything but perfect from a sewerage point of view; because we are only just completing our main sewerage scheme, and therefore we have not derived the full benefit from our sanitary improvements.

17,209. (*Sir James Paget.*) Then I want to know why your sanitary condition being unsatisfactory you yet can refer your zymotic disease death-rate in any degree

to vaccination?—Because while our death-rate from zymotic disease has very much declined, our vaccination has also very much declined.

17,210. One of those changes being one which has brought about the diminution in zymotic mortality in every other town in England, and the other being peculiar to Leicester, how do you maintain that the decline of vaccination has had any influence at all?—Because, notwithstanding our yet imperfect sanitation, and bad geological and geographical position the decline in our zymotic death-rate as well as the decline of our vaccination rate exceeds that of the other towns mentioned.

17,211. (*Mr. Meadows White.*) What you maintain is that you are affected by improved sanitation as are all the other towns in the kingdom; but you say that in addition in Leicester there has been an influence from diminished vaccination, an influence which has not existed in other towns?—Yes, I say that our death-rate in the younger ages and from all causes has declined much more rapidly than the death-rate in the rest of the country.

17,212. (*Chairman.*) Do you mean the rest of the country on the average, or any other place in the country?—On the average, for the country generally, as well as for many other places.

17,213. But must you not for these particular purposes compare it with particular towns where vaccination has prevailed in order to give it any value, because as to improving more than the rest of the country on the average, that may be because other places have improved very little and have not applied sanitary improvements whereas you have?—Suppose such be the case, it would only go to prove that sanitation without vaccination, is quite able to cope with small-pox as well as the other zymotic diseases. But taking the large towns apart from the rural districts, I say that that the proportionate improvement is greatest for Leicester.

17,214. What is the next head of statistics that you propose to deal with?—Resuming my statement on Table 20, I find that our average annual total mortality from the seven principal zymotic causes for the period of highest vaccination, 1863–72, is also greatly in excess not only of the periodic average death-rate, which it exceeds by 1,830 per million, but also is in excess of the death-rate for every other period, even exceeding the death-rate of the most remote period, 1838–42, by 475 per million, which otherwise might have been expected to be the highest. But with declining vaccination the death-rate for the whole of these diseases shows an unprecedented decline, and on our estimated population we are at present without vaccination saving nearly 680 lives per annum from zymotic causes alone as compared with the period of highest vaccination. If this rate of saving had been attained all through the country it would mean an enormous saving of life and even a very much greater saving of life proportionately between the two periods than we are now experiencing in Leicester. Diagram G as well as Table 20 which it illustrates, show us that without the aid of vaccination small-pox has disappeared, measles has greatly declined, scarlet fever has also largely declined, diphtheria has remained nearly stationary, but whooping-cough has fallen a long way below its average death-rate, and the mortality from ordinary fevers and even the Leicester scourge diarrhoea also shows a tremendous decline now that vaccination is discarded, and our sanitary condition so much improved.

17,215. There is no particular decline in scarlet fever, is there, until the period of 1883–87?—No, not from that one disease until 1883–87. Continuing my statement I may say that the next point I wish to lay before the Commission is a comparison between the death-rate from the seven principal zymotic diseases, and, after eliminating small-pox, the remaining six. Whether we omit or include small-pox, no great variation occurs in the relative total mortalities from either the six or the seven principal zymotic causes with one important exception. Small-pox intensifies the zymotic mortality during the prevalence of highest vaccination, and it has the effect of abnormally raising the proportionate zymotic mortality when vaccination was most rigorously enforced; and when according to vaccination theories, small-pox mortality should have been the lowest we find that it was the highest.

17,216. Was not the zymotic mortality of 1868–72 chiefly influenced by the increase of diarrhoea and not



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of small-pox?—Diarrhoea then bore a less proportion to the total zymotic mortality than it bears at the present time.

17,217. I am speaking of the increase in 1868-72 as compared with the previous period?—Yes, for the fatal vaccination period of 1868-72, it was very much in excess of previous averages. To show the comparison between the death-rate from the six and seven zymotics, I now hand in another table and a diagram illustrating it. (*The table and diagram were handed in. See Appendix III., Table 21, page 441, and Diagram H., facing page 441.*) Table 21 shows the average annual deaths and death-rate per million population from each of the seven principal zymotic diseases, also from six, excluding small-pox in quinquennial periods, with the average annual registered vaccinations per 250,000 population and the average annual number of sanitary orders to abate nuisances. The diagram shows (1), the average annual death-rate per million living, from the seven principal zymotic diseases, in quinquennial periods 1838-1889; (2), a gradual decrease in zymotic mortality in the earlier periods (since 1848-52) as sanitary measures were introduced.

17,218. Does the death-rate per million mean from all causes?—No, not in this diagram, the death-rate per million here means from the six and the seven zymotic diseases.

17,219 Taking the first case, the annual average, the death-rate per million refers also to the zymotic diseases?—Yes, to the seven zymotic diseases, and also to the six as you see at the head of columns 4 and 5 of Table 21.

17,220. The average annual deaths is not the rate?—No, that refers to the actual number of deaths; the death-rate is given below it for the seven zymotic diseases and then also for the six in the next column. Continuing, the diagram shows, thirdly, an increased and unprecedented zymotic fatality coincident with the penal enforcement of vaccination (1868-72), the rapid decline of this fatality with the falling off of vaccination (1873-82), and a very low rate of zymotic mortality coincident with the practical abandonment of vaccination (since 1882), and the further development of sanitation; and (4), that the share borne by small-pox, of the death-rate from the seven zymotic causes alone, is comparatively insignificant. These columns show the death-rate for the seven principal zymotics, but there is at the top a darker shading, which represents the proportion of deaths from small-pox. Without this darker shade, the lighter shading represents the deaths from the other six zymotic diseases, that is to say, the average annual death-rate per million from the six principal zymotic causes, omitting small-pox. The red curve shows the average annual registered vaccinations to a quarter of a million population. I take that rate to suit the compass of the index figures at the side of the diagram so that they may apply to the vaccinations as well as to the deaths from zymotic causes. The blue curve shows the average annual number of orders issued by the sanitary authority for sanitary improvements. Grouping the diseases together in five year periods, and comparing column with column, it will be seen that whether we take the tops of the columns, which include small-pox, and represent the death-rate from the seven zymotics, or if we only take the upper edge of the lighter shading representing the death-rate from the six zymotics without small-pox, the columns occupy the same relative positions in regard to height, differing only in proportion as small-pox varies. We find that there was about the same rise in mortality with increased vaccination whether we take the six or the seven zymotics, and that they correspondingly fall as vaccination decreases. When the vaccination curve becomes scarcely perceptible, as in the last two periods, the sanitary curve rises to its greatest height, small-pox mortality disappears, and the zymotic mortality falls to the lowest point ever reached for the 52 years.

17,221. But according to this table (Table 21), comparing the periods 1848-52 and 1853-57, the vaccination rate rises largely while the death-rate falls very considerably?—Do you mean in the period 1853-57?

17,222. Yes?—There is a diminution in the death-rate, but about that time most of the Acts of Parliament were introduced which led to the sanitary improvement of Leicester.

17,223. You were saying that it was to be observed on looking at this table that as the vaccination curve rose the death-rate rose, and as it fell the death-rate

fell. I was pointing out that that was not of universal application because it does not follow comparing 1848-52 with 1853-57?—Generally speaking the vaccination curve and the death-rate do rise and fall together, with the single exception your Lordship has named.

17,224. Not, according to this, proportionately so, because there is a much greater comparative fall in your deaths, for example, in 1873-77, than on your vaccination curve compared to the previous quinquennium, is there not?—Yes, but although the fall may not be mathematically proportionate, they do fall together for the period you have named.

17,225. A fall in the vaccination column with a larger fall in the number of deaths?—That is accounted for in this period principally by the almost entire absence of small-pox.

17,226. No, it cannot be; take out small-pox altogether and the observation I made is equally true, is it not?—It is relatively true, but not equally true, because the proportion of deaths for 1868-72 is very much greater than for 1873-77.

17,227. Of course if you include small-pox it is still more striking. Then you have a great fall in the vaccination curve in 1858-62 as compared with 1853-57; then there is a rise again in 1863-67; there is nothing like the proportionate change of relative deaths in those three quinquennia, is there?—There is a concurrent decline for the period 1858-62 which follows the general course; the only exception I notice to this almost parallel movement is in the period 1853-57, to which your Lordship has already alluded.

17,228. But what I mean is that there is a marked rise again in the vaccination curve without any very marked decline, or marked rise, at all events to the same extent, in the death-rates?—But with this single exception they all follow the same order.

17,229. (*Sir James Paget.*) Not in the same proportion?—No, not quite in the same absolute proportion.

17,230. (*Chairman.*) I am not sure that you will find on investigation that there is any substantial difference between the vaccination line of 1873-77 and the vaccination line of 1868-72, if they are both taken on the same basis?—Yes, we should; for I have given you the number of vaccinations paid for, and although the actual number of vaccinations paid for in 1873-77 was slightly in excess of that for the period 1868-72, yet proportionately the vaccination rate was much higher for 1868-72, and the per-centage of vaccinations to births I am sure bears the same relation.

17,231. It is very important, because supposing your red line 1868-72 were substantially in the line from 1873-77, would not that afford a strong argument against what you are just advancing?—Even if that were so it would not afford a very strong argument, for this reason, that during the quinquennium 1868-72 we suffered from an epidemic of small-pox which had only just spent itself.

17,232. But you would find if you omitted small-pox altogether a very marked fall indeed from 1868-72 to 1873-77, without any corresponding fall in the vaccination, you would find without any fall in vaccination a much more marked fall in this 1873-77, as compared with 1868-72, than as between 1873-77 and the next quinquennium?—Such an argument could only be based on the assumption that there was no fall in the vaccinations for the period mentioned. There is a much more marked fall in the deaths, whether we omit small-pox or not; but I have never argued that the rise or the decline bear an absolute proportion one to the other. There is a fall in both vaccinations and the death-rates for both periods.

17,233. If on investigation it turns out that there ought to be no fall at all in your vaccination in the period 1873-77, as compared with 1868-72, then the marked fall which took place in the deaths in that quinquennium, which was more marked than the fall in the next quinquennium when vaccination was decreasing, would tend to show, would it not, that the vaccination rate and the death-rate from those diseases were not connected?—That is so.

17,234. (*Dr. Collins.*) The period of 1873-77 shows a marked increase as regards sanitary notices as compared with the period of 1868-72?—Yes, there was a much greater activity on the part of our sanitary authorities which was due to the epidemic of 1871-72.

17,235. (*Chairman.*) Is there anything more that you desire to point out upon these tables?—Yes, I have



some comparisons to give as to the death-rate from six of those diseases.

17,236. (*Sir William Savory.*) I wish to call your attention to the curves, shown on your Diagram H., between 1858-62 and 1868-72; there is a period of 15 years embraced in that?—Yes.

17,237. With the increase of your sanitary measures there is a distinct increase in the general mortality and in the small-pox mortality?—Yes, but the slight increase in the sanitary curve there was due to the appearance of the small-pox epidemic, and was more than counter-balanced by the far greater increase shown by the vaccination curve.

17,238. Any one with common sense would say that the one followed upon the other I suppose; that in consequence of the increase in the zymotic diseases generally, and small-pox in particular, there was an increase of the sanitary measures—that it was the effect and not the cause?—Yes, as I explained last week, I gave you the number of sanitary orders issued for each of the years 1868-72 showing that in 1871 and 1872 when small-pox was epidemic there was a considerably larger number of sanitary orders than in the first three years of that quinquennium.

17,239. But for anything this diagram shows to the contrary the reading which might be put upon the vaccinations would lead one to assume that the increased vaccinations were followed by an increased mortality from small-pox?—Taking my Table 21 in connexion with the annual table it will be seen that this is not an assumption, but an incontrovertible fact based upon the annual vaccination statistics. That could not be assumed under any circumstances, because the number of vaccinations are shown to have increased enormously in the earlier years of the quinquennium to which you are referring.

17,240. But they might have brought about the increased deaths from small-pox so far as this table goes; it does not show what relation the two bore to each other in point of time?—But by reference to the other tables you can ascertain that relation.

17,241. But so far as this table goes the reading of the one may be applied with equal justice to the other?—It is impossible for me to give all the details in one table. I have shown that an unprecedented rise in vaccination took place before that fatal epidemic of 1871-72 and not as a consequence of it; but in saying this I am not affirming that there was necessarily no increase of re-vaccinations in consequence of the epidemic.

17,242. What I submit to you is that these tables do not show the relation in point of time of those conditions which you assume to be cause and effect; you may show it elsewhere but you do not show it here?—In dealing with this complicated question we must deal with it in sections, and if you would kindly turn to Table 19 which precedes the quinquennial table now under consideration you will find that that is the annual table upon which both Tables 20 and 21 are based. In Table 19 you have got the annual death-rate and the annual rates of vaccination for each year; I do not know how you can possibly expect annual figures to be set out upon a quinquennial table. I have, in every instance, preceded the quinquennial by its annual table, so that by using both you are able to ascertain and to lay your finger upon any point you wish.

17,243. Then I can only repeat what I said to you on the last occasion, that it would have been quite as easy to have set forth on your diagrams yearly as five yearly columns?—I may be allowed once more to remind you that this is exactly what I have done. I have given you tables which set forth the yearly mortality. I could of course produce from those tables diagrams showing the annual zymotic mortality, if desirable; but I do not see that we should gain any further information beyond that obtained by putting it in the five year periods.

17,244. Then I take it that in this diagram of yours and the preceding one there is a constant relation between the increase and decrease of vaccination and the increase and decrease of zymotic diseases?—Yes, generally speaking that is shown upon the diagram and also upon the tables.

17,245. The object of that is to show that vaccination holds a definite relation to those diseases?—That it holds some relation to them.

17,246. Why do you shrink from saying that it holds a definite relation and is a fixed cause when you have these tables; do not these tables show that vaccination is the direct cause of these diseases?—Perhaps the Commission itself can deduce from the tables the precise amount of effect vaccination has had upon the death-rate.

17,247. I am not discussing the deductions of the Commission, I am asking you why you shrink from saying that vaccination is the direct cause of these zymotic diseases?—I do not shrink from making that affirmation with certain reservations. It would be absurd for any one to state that vaccination was the cause of the whole of these zymotic diseases some of which have been in existence, probably before vaccination was known.

17,248. Then you would say vaccination is one of the causes of zymotic diseases?—Yes; and if we bring before you a set of figures and diagrams and tables, which of themselves represent absolute facts showing these results, why should any one shrink from accepting them.

17,249. That is my question: do you say at once boldly upon these facts that vaccination is one of the causes of zymotic diseases?—I do say it intensifies their fatality, and that it is a predisposing cause.

17,250. But why put in the word "predisposing." Before you heard the word from Dr. Collins you did not use it?—I used other words "exciting cause" which represent almost the same meaning. It is only a different form of expressing the same idea.

17,251. But why use the word "predisposing" at all; why not speak of vaccination as the cause of zymotic diseases?—Because it is not the sole cause, it is, however, one of a number of causes, as is shown by my tables.

17,252. When you use the word "predisposing" you mean that there are other causes?—Yes. I believe that vaccination is strongly predisposing to zymotic disease.

17,253. You will not say it is the cause without using the word "predisposing"?—Yes, I will, because I believe that in many instances it is the direct cause of disease and death without being merely "predisposing."

17,254. (*Sir James Paget.*) I observe from your Diagram H. that the average annual number of sanitary orders to abate nuisances has increased in a much larger proportion than vaccination has diminished?—You mean that sanitation has increased even more rapidly than vaccination has declined. So I think.

17,255. In the periods 1848-52 up to 1868-72 there is a considerable rise as you see in the number of vaccinations, but there is a much greater rise in proportion in the number of sanitary orders?—I do not think we shall find that to be the case, because a clerical error was made by the registrar in the earlier period which abnormally raised the vaccinations for that period.

17,256. The rise is from something over 7,000 in the first period to something over 9,000 in the last?—That 7,000, you will kindly allow me to explain, will be reduced by the correction of the clerical error found in the official vaccination table.

17,257. Suppose it were reduced to 6,000, then it would be a rise from 6,000 to rather over 9,000 vaccinations; but the sanitary orders have increased from 200 to about 1,200 in the same time, that is to say, from 1848-52 to 1868-72?—It is just over 200 in the first period.

17,258. Then in the highest period of vaccination it comes up to something over 1,200?—The exact figure is 1,133, as you will find in Table 21.

17,259. Then I understand that it increased nearly six-fold?—Yes; but I explained at the last sitting of the Commission that the principal part of that increase for 1868-72 was due to the additional efforts made by the sanitary authority in the last two years only of the five. I gave you the years separately so that you might apportion their effect.

17,260. But it begins to rise at 1863?—Yes, the sanitary curve begins to rise then.

17,261. And rises to 1868?—Yes.

17,262. And then goes on, and while vaccination falls it rises still higher?—Yes, from 1873 to 1877.

17,263. It falls a little again and then rises to a very large amount?—Yes. It rises in 1883-87 to an annual average number of 6,529 sanitary orders.

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17,264. Therefore the rise in the number of sanitary orders is equal to the fall in vaccination?—It is about equal; as one rises the other declines.

17,265. And then rises again, while the vaccination still further falls?—Yes.

17,266. But can you separate the influence of the considerable increase in the sanitary orders from the influence of the fall in vaccination?—As I regard them both to be indications of sanitary improvement, it is an influence I could not possibly separate.

17,267. Then why do you assume that vaccination has anything to do with it?—I do not think there is much assumption about it when we find such evil results as we do arising from the carrying out of vaccination. Speaking not only of Leicester, but generally, I believe you will find that with the more rigorous enforcement of vaccination all over the country there was an increased death-rate.

17,268. But why not assign that in a great part or wholly to the increase of sanitation?—I do not know of any reason why we should assign the greater part or the whole of an increased death-rate to the increase of sanitation. The idea is utterly absurd and unscientific. I have been told here this afternoon that many towns were far before Leicester at that early period in regard to sanitation. Yet our death-rate is now below theirs.

17,269. (*Chairman.*) But we have not the facts before us?—It was stated that some of the towns at an early period were in a far better sanitary condition than Leicester, and that would account for their lower death-rate at that time.

17,270. You have had during a certain time a diminution of certain diseases. The question is what is the cause. You admit there has been a cause in operation, namely, these sanitary orders; there is another suggested cause which is disputed, namely, the effect of giving up vaccination; now what I put to you is this: you admit the operation of a cause, which, if you knew nothing about vaccination, would so far as you know be sufficient to account for the diminution, namely, improved sanitation?—If I knew nothing about the effects of vaccination I might be disposed to say that would account for the improvement.

17,271. Then in view of the existing cause, which in the absence of anything relating to vaccination would sufficiently account for the diminution, what is your ground for the connexion between doing away with vaccination and any of that diminution? What reason is there for saying that vaccination has anything to do with it?—It is not disputed. In fact, one of the hon. members of this Commission stated at a previous meeting that deaths were known to have resulted directly from vaccination. Surely if vaccination is a cause of death it must increase the death-rate to some degree, and it would therefore increase the number of deaths from specific diseases to that amount.

17,272. The deaths from vaccination would be so very few in comparison with the other deaths from other causes as to make a difference which would be imperceptible. would they not?—They might be almost imperceptible as compared with the deaths from all causes, but they cannot be said to have been few of themselves when nearly a thousand deaths have already been registered as directly resulting from vaccination. But if it is once admitted and established, as I think it is universally, that vaccination can be a cause of death, it is only reasonable to follow that up by saying that if it is a cause of death it is also a cause to a very large extent, of lowering the vitality of children and therefore rendering them more likely to die of other diseases where the evil effects of vaccination are less suspected.

17,273. I quite understand that as a matter of argument, that so far as it causes death it increases the death-rate, and so far as it does not increase the death-rate it causes a liability to disease in those who do not die; but we are dealing now with the supposed evidence from your statistics; how do your statistics show it, there being at the same time in operation a cause which if you knew nothing about vaccination would be quite sufficient to account for the diminution; what is there in these statistics to connect vaccination with the deaths from zymotic diseases?—You ask me to expunge from my knowledge a factor which cannot justly be eliminated. I think there is sufficient evidence upon these tables and documents to show clearly that some fatal influence has interfered with the decline in our death-rate which had set in with the introduction of sanitary measures. I think this detrimental influence was

vaccination. If it were possible for anyone to place a diagram before this Commission showing exactly opposite results, I am quite sure that the conclusion would be arrived at in some minds that vaccination had been a great protecting influence.

17,274. But the difficulty arises from your own table. You show in your table that another cause has been in operation?—Yes.

17,275. And you admit that that cause, if you knew nothing about the other, would be sufficient to account for the whole?—If we knew nothing about vaccination we should attribute it all to that other cause, but knowing something of the evil effects of vaccination we are bound to attribute some part of the improved result to the removal of that detrimental influence.

17,276. (*Dr. Collins.*) Do you find sufficient evidence, apart from your tables, indicating to your mind that vaccination is a cause of death, and is a cause of zymotic death, which, taken in connexion with your tables, tends to strengthen the opinion which you have formed that vaccination is a part cause of zymotic mortality?—Yes, I have the evidence (part of which I have already laid before the Commission) that in the judgment of many parents their children have suffered from vaccination, and have died from the evil effects of vaccination.

17,277. (*Chairman.*) From zymotic disease?—No, that they have suffered from vaccination and died in consequence of vaccination.

17,278. Of a zymotic disease?—In regard to zymotic disease I am not able to say that any specific zymotic disease has been the result of vaccination and therefore in that sense the cause of death.

17,279. But if they died from something else, although the vaccination was the predisposing or exciting cause, it would not affect your zymotic tables, would it?—Certainly not if they died of a cause other than zymotic disease.

17,280. Then it is only so far as you have evidence connecting zymotic disease with vaccination that the point you allude to would be important, would it not?—Yes, but then the death-rate from zymotic diseases, especially in the younger ages, was much higher during the period of rigorous enforcement of vaccination than in any other period.

17,281. But that period was a period of much less sanitary condition than the present, was not it?—Yes.

17,282. And a bad sanitary condition is a condition very likely to affect infant mortality from zymotic diseases, is it not?—Yes, the mortality from all of them, even including small-pox, but that point touches on some statistics which I have here relating to our sanitary work, showing that long after the period of 1868–72 certain insanitary conditions existed in Leicester which I think were conducive to a high zymotic death-rate, especially from diarrhoea. These conditions were owing to the fact that our sewerage system, which is laid with a very small gradient, became almost entirely choked. I have here a representation of one of our sewers which was found in that foul condition in the year 1877. You will find a diagram showing this in our Medical Officer's special report on zymotic diseases in Leicester during 1877. Immediately afterwards, as we read in a footnote on page 49 of the same report, "openings were made into the main sewer in Northgate Street and Woodbo Street; the former was found to be two thirds full of silt, while the latter was quite full; and in both instances most evil odours were given off from the deposit." These sewers have since been cleaned, and many of them taken up and sewers of twice their capacity put in; consequently the insanitary condition of the town was actually worse after the epidemic of 1871–72, and in such a way as to be more likely to be conducive of diarrhoea. Yet notwithstanding these special sanitary defects, with declining vaccination we had fewer deaths from diarrhoea. This again would point to some other cause outside our sanitary condition which had caused those deaths; and I know of no other deleterious influence operating at that time in the town besides vaccination.

17,283. Do you mean that there was no improvement in the sanitary condition between 1873 and 1877?—No, I say there was an improvement so far as the issue of sanitary orders for improvement was concerned, but there was this silting process going on at the same time, and the malarial condition of the sewerage was not dealt with, nor attempted to be dealt with, till 1877 or 1878.



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17,284. Can you give the date when it was opened?—You will find the account at page 49 of Dr. Johnston's report upon the sanitary condition of Leicester; the special report for 1877. That was the time when these sewers were opened, and since that time a continuous system of cleansing the sewers has been going on, especially since 1881, 1882, and 1883. A new main sewerage system has been designed and partly laid since that time. Old sewers have been taken out, and the construction of subsidiary sewers commenced, and where the fall for the drainage was found to be defective it has been improved. So that really there were insanitary conditions existing of a serious kind, and of a character likely to augment our diarrhoeal death-rate at the time when, with declining vaccination, we had a diminished death-rate from diarrhoea.

17,285. (Dr. Collins.) Do you happen to be acquainted with the official returns moved for by Mr. Hopwood in the House of Commons as to infant mortality?—Yes, I have seen them, if you refer to the returns relating to a number of zymotic and inoculable diseases, syphilis amongst others.

17,286. Have you gone through those returns with a view to ascertaining if you can find any corroboration of the view you have been placing before the Commission to-day?—I think there is very great corroboration; I cannot remember the exact figures, but I know that the rise in the death-rate for this particular group of diseases was very great, and that the rise appeared to be coincident with the more stringent enforcement of vaccination.

17,287. I was going to ask you whether any of the diseases dealt with in your tables were dealt with in these returns, notably diarrhoea?—Diarrhoea is dealt with, and in the aggregate its mortality was, I believe, about doubled.

17,288. (Chairman.) A rise in zymotic diseases since when to when?—I could not tell you at this moment the exact date when the table commenced, but the returns come nearly up to the present time.

17,289. Do you mean that the zymotic diseases are more now than they were 20 or 30 years ago?—I mean that the infantile death-rate under one year referred to those diseases is proportionally greater now than it was before vaccination was so fully practised. The death-rate is given per million, I believe, in those tables. Resuming my statement on the sanitary question, I should like to say that Leicester for many years suffered from flooding, and I have here a diagram which shows the section of a large flood scheme that we are now carrying out which lowers the water level, and the line of saturation for Leicester, 7 feet all through the town. The highest flood that we ever had was in 1882. The level is up at a very great height above the old water level, we have now reduced that 7 feet, which I think will have a very important bearing upon the town.

17,290. The year 1877 was not a high year of mortality from diarrhoea, was it; it was rather an exceptionally low year?—The rate was 1,661 per million.

17,291. The absolute number is 185, which is lower than for many years before 1879, and for many of the years afterwards; in fact, of the 10 years 1870–79 it appears from your Table 19 that 1877 was with one exception, namely 1879, the year of the lowest death-rate from diarrhoea?—The diarrhoeal deaths for the year 1879 are less than half those of 1877, but the following year, 1878, has also a very high death-rate from diarrhoea. I have no doubt that during 1877 and 1878 a number of these sewers would be opened, and we have recently observed that while the new sewers were being laid, numerous cases of diarrhoea and other diseases have arisen along the line of the old and open sewers.

17,292. But the year 1884 was very much higher than the year 1877?—The year 1880 was a year of still higher diarrhoeal mortality.

17,293. And the year 1884 was very high?—Yes.

17,294. I do not quite see the connexion between the specially bad state of the sewers in the year 1877, when although you described the sewers as being in a bad condition yet you show it to be a year of low mortality from diarrhoea and of low mortality from typhoid, both of which conditions are very much affected by bad sewerage?—Yes; but I show that if that state of things had continued it would have had very serious consequences. Perhaps I had better just refer to the local Acts while

we are upon this subject, as they bear upon the question of the carrying out of sanitary improvements. We had an Improvement Act in 1846 to confer general powers upon the Town Council for the improvement of the borough; the Cemetery Act of 1848 to enable the Corporation to establish a cemetery; then there was the Lunatic Asylum Act in 1848, which was to enable an arrangement to be made with the county asylum for the care of borough lunatic paupers; the first Sewerage Act was passed in 1851 to enable the Corporation to construct sewerage works, and for other purposes; the Cemetery Amendment Act was passed in 1860 to provide additional accommodation at the cemetery. The Lunatic Asylum and Improvement Act of 1865 was an Act to empower the Corporation to provide an asylum and to authorise the establishment of a new hay market, and for other improvements. Then there was the Cattle Market, Town Hall, and Improvement Act of 1866, the purpose of which was to empower the Corporation to remove the cattle market from the centre of the town to another site and to erect a town hall. Then there was the Improvement Drainage and Markets Act of 1868 for the execution of flood and sewerage works; and a further Act, the Lunatic Asylum Act of 1870, to extend the power of the previous Act of 1865. Then there was the Improvement Act of 1874 to carry out the construction of flood works. Then there was the Provisional Order of 1874 to enable street improvement works to be made. In 1876 we had another Improvement Act to supplement the previous Act for the carrying out of flood works, and in 1878 we had an Act to transfer the gas and water undertakings to the Corporation. In 1879 we had the Corporation Act to vest in the Corporation a piece of land in Humberstone Gate, one of our main thoroughfares called "No Man's land," and to provide for the notification of infectious diseases, and for other purposes. In 1881 there was another Improvement Act to enable us to extend the flood prevention works; there was the Corporation Act in 1884, and the Waterworks Act in 1890 to enable the Corporation to provide works for an additional water supply; and since that time, or during the last few years, the Corporation has been carrying out a new system of main sewerage, and we have provided an artificial outfall so as to increase the gradient of the sewers. We have also taken over a large amount of land, about 1,400 acres as a sewerage farm. The whole of these improvements are of course calculated to greatly benefit the health of the town. Now referring again to Diagram H. and Table 21, as in the previous table and diagram, I have shown the period, 1868–72, when vaccination was at its highest, produced the maximum number of deaths per million both in the group of six and in the group of seven zymotic diseases. The influence of sanitary measures began to take effect from about 1848, and the reduction of the rate of zymotic mortality is seen by the fall from 6,377 per million in period I. to 4,616 per million in period V. Calculating the general effect of the respective death-rates upon the population of Leicester we have the following results, by comparing the death-rate of the fatal vaccination period 1868–72 with the death-rate for 1888–89, when vaccination is almost entirely absent. The zymotic death-rate for the former period was about 680 deaths for each of the five years in excess of our present average annual zymotic death-rate. This would mean on our present population a total increased loss of about 3,390 lives from the seven principal zymotic diseases in five years of high vaccination. But in our present sanitary era without vaccination all these 3,390 lives are being saved. Comparing for the six zymotic causes the death-rate prevailing in the high vaccination period of 1868–72 with the death-rate in 1888–89 we find in the former period an average annual loss of 3,700 lives per million in excess of the latter period. This represents an actual loss of about 555 lives per annum on our estimated population, or 2,775 deaths for a period of five years. These lives are now being saved, and, vaccination being discarded, this saving can in no way be ascribed to vaccination. I now come to another factor which appears to me to affect vital statistics. It may differ in some respects from those I have already dealt with, but they seem to be somewhat allied. I refer to the marriages, births, and the general death-rate of the total population as distinct from deaths from the specific causes already dealt with. I therefore now hand in a table which gives the registered number of persons married, the registered births and deaths; with the estimated population at the middle of each year from 1838 to 1889 inclusive. (The table was handed in. See Appendix III., Table 22, page 442.) There are a few



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years worthy of a passing notice. One is the year 1840, which was referred to by Mr. Meadows White, and which had comparatively speaking very few marriages, but an enormous number of deaths. Another year is 1850, having a large number of marriages, and the ordinary number of births, but a comparatively small number of deaths. The year 1868, the first year of penal vaccination, had an average number of marriages and births, but there is a very great rise in the number of deaths.

17,295. Not very great, is it? Take the year 1863; the deaths in proportion to the population would be more in 1863 than in 1868, would they?—The rate is given in the next table which I will now hand in. (*The table was handed in. See Appendix III., Table 23, page 442.*) Table 23 gives the annual rates for the absolute numbers contained in Table 22. The highest marriage-rates are found in the years 1863, 1864, 1865, and 1866, being about 25 and upwards per 1,000 population. The highest birth-rates occur in the years 1873 and 1876, both of which exceed 44 per 1,000. The highest death-rates occur in the years 1840, 1842, 1845, 1846, 1849, 1852, 1858, 1863, and 1868. In nearly all these years the death-rate exceeds 28 per 1,000. In all these years, too, a high per-centage of vaccination prevails. From 1868 to 1872 a very high death-rate prevails, each of the years showing a death-rate of over 25 per 1,000 and a per-centage of vaccination of over 80 to the total births. The death-rate of 1868 is only exceeded by seven other years in the whole range of the 52 years under consideration. In 1862, 1865, 1866, and 1867 we have the lowest per-centages of vaccination prior to 1868, and comparatively low or moderate death-rates for each of those earlier years. Grouping these rates into quinquennial periods, we have the results tabulated in the table which I will now hand in. (*The table was handed in. See Appendix III., Table 24, page 443.*) This table shows the average annual number and rates per 1,000 population of persons married, of births, and of deaths in quinquennial periods, 1838–89, with the average annual registered vaccinations per 100,000 population. The marriage-rate rises in the first 15 years from an annual average rate of 20·58 to 22·10 per 1,000 total population.

17,296. What inference do you draw from the marriage and birth-rate in connexion with the subject we have to discuss?—Not only that the marriage-rate affects the birth-rate, but the particular point I want to show by these tables is, that although it is often affirmed that a high birth-rate causes a high death-rate, as far as Leicester is concerned, we have just the opposite result. Perhaps I had better show that at once by referring you

to the birth-rate. If you look at the period 1868–72, on Table 24, you will find that the birth-rate is 41·6 per 1,000 population, and that it does not reach its maximum till the period 1873–77, whereas the death-rate is much higher in 1868–72 than it is in the subsequent period when the birth-rate had increased. The birth-rate commences in the first group of years at an annual average of 38·96 per 1,000 and it falls to 37·15 per 1,000 in period V., after which it rises continuously until the maximum 42·69 per 1,000 is reached in period VIII., 1873–1877, from which date it rapidly falls to the minimum of 32·3 per 1,000 in 1888–89. The death-rate starts at an average annual of 28·09 in period I., and it shows a continuous fall to 24·48 in period V., 1858–62. It then rises for 10 years until, in the fatal vaccination period of 1868–72, the death-rate reaches 26·82 per 1,000, being a higher average annual death-rate than any attained for 25 years preceding and including period VII., and it was also a higher average annual death-rate than Leicester had experienced since the practice of vaccination became general in 1849. Since the fatal vaccination period of 1868–72, both vaccination and the death-rate have continuously and rapidly declined, until in 1888–89 our minimum death-rate is reached, being only 17·39 per 1,000. With increasing vaccination we have an increased death-rate, and with rapidly decreasing vaccination we have a greatly decreasing death-rate, until now we are grouped by the Registrar-General with Brighton and other healthy towns.

17,297. Lately for the last two quinquennia and the last two years there has been a rapidly diminishing birth-rate too, has not there?—Yes, there has been a rapidly diminishing birth-rate, but the highest birth-rate followed the highest death-rate in 1868–72, and in my opinion it was due very largely to the gaps that had been made by the high death-rate of 1868–72 in the infantile population.

17,298. I do not quite understand you?—Where we have a high death-rate of children of young ages it is a natural law that the births should increase, and I think that is proved by this table. We had a very high infantile death-rate from 1868 to 1872, and as a natural consequence it was followed by a high birth-rate.

17,299. Do you mean a larger proportion of children who die or a larger proportion of children born?—I mean that, as a rule, after a high infantile death-rate, there is a natural tendency to an increase of the birth-rate. I have a diagram here which I will hand in illustrating Table 23. (*The diagram was handed in. See Appendix III. Diagram J., facing page 442.*)

Adjourned till Wednesday next at 1 o'clock.

## Seventy-second Day.

Wednesday, 8th July 1891.

PRESENT :

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

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17,300. (*Chairman.*) You were proceeding to Diagram J. when the Commission last adjourned?—Yes. Diagram J., which I handed in last week, shows : (1.) the annual number of persons married per 1,000 population ; (2.) the annual birth-rate per 1,000 population ; (3.) the annual death-rate per 1,000 ; and (4.) the annual per-centage of registered vaccinations to total births. I

will now hand in Diagram K., which is Diagram J. in five-year periods, and illustrates Table 24. (*The diagram was handed in. See Appendix III., Diagram K., facing page 443.*)

17,301. Dealing first with Diagram J., the blue line represents the annual number of persons married per



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thousand of the population; what are the materials from which you obtain that?—They are based upon returns furnished to me by the registrar at Leicester.

17,302. Of the marriages?—Of the persons married.

17,303. And your population is obtained how?—The population is obtained on the basis I explained before.

17,304. Then your annual birth-rate is arrived at in the same way?—In the same way exactly. It is a birth-rate per 1,000 population. The numbers were supplied to me by the registrar, and the calculations are based upon the revised estimated populations.

17,305. And your annual death-rate?—The annual death-rate is calculated in the same way; that is, the deaths per 1,000 population.

17,306. Then Diagram K. deals with the same materials in quinquennial periods?—Yes, giving the average annual rates for each period of five years.

17,307. How do you deal with the numbers in arriving at the birth-rate, for example, with the population; at what period of the quinquennium do you take it?—We added together the annual birth-rates for five years, and then took a fifth for the average annual. Taking one-fifth of the births, and the middle year for the population, the rates calculated upon that basis would be practically the same.

17,308. Diagram K. states in its heading "This diagram shows in quinquennial periods (1) that the highest average annual death-rate per 1,000 living (since the introduction of vaccination in 1849) is coincident with the highest vaccination period"; what does that mean "Since the introduction of vaccination in 1849"?—The year 1849 was as far back as we could get with complete official figures. I tried to get further back but was unable to do so.

17,309. You mean you have not the figures earlier?—Yes, we have no reliable figures in a useful continuous form earlier than that date.

17,310. Then it is not accurate to say since the introduction of vaccination in 1849; you mean "since the earliest vaccination statistics in 1849" because vaccination was introduced before 1849, was it not?—Yes, vaccination was introduced before 1849, but the statistics before that time are intermittent; they are not continuous. We have some figures, but they are not sufficiently complete and continuous to present to this Commission until 1849, when we find the practice had become general.

17,311. I am only calling attention to the fact that "since the introduction of vaccination in 1849" would convey an erroneous impression of what you meant, what you mean is, "Since the commencement of the vaccination statistics in 1849"?—Perhaps that form of expression might explain it more fully, and be a better phrase to use.

17,312. It purposed to show, secondly, that "the lowest death-rate per 1,000 living coincides with the general abandonment of vaccination (1883-89) and, thirdly, that the highest birth-rate per 1,000 living occurred in the period immediately succeeding the abnormal death-rate of 1868-72, notwithstanding a declining marriage-rate and death-rate"?—Yes, the birth-rate increased while the death-rate declined, which is a very suggestive fact taken in connexion with the previous increased infantile mortality.

17,313. (Mr. Whitbread.) The first heading means "Since the introduction of regular statistics of vaccination," that would cover it?—Yes, that would cover my meaning.

17,314. (Mr. Meadows White.) You start from the period when there were 48 in every 100 vaccinated?—No. This vaccination rate is based upon 100,000 population. Only one-fiftieth is shown upon the diagram to accommodate the index figures, and it amounts in the first period to 43.

17,315. However, vaccination had reached at that time a considerable proportion to the population?—Yes, it had. According to my Diagram B. we find that vaccination continued optional in Leicester until 1842, and that even in 1845 and 1846 there was very little vaccination registered in Leicester. It was not until 1849 that any considerable amount of vaccination was performed in the town. Perhaps these words would, therefore, better suit the heading Diagram K., "Since 1849, when vaccination became general."

17,316. (Chairman.) Now dealing with these diagrams what is the point to which you wish to direct the attention of the Commission?—The main point is in regard to the birth-rate and the death-rate. The death-rate rises in 1868-72 higher than it had been for the previous 20 years.

17,317. You are talking of quinquennial periods now?—Yes, I am talking of quinquennial periods. The birth-rate which is supposed to affect the death-rate, and probably does so to some extent, does not reach its maximum till some years later, as is shown in the next quinquennium, 1873-77. I entered into that subject last week and I offered some explanation as to the probable cause of the higher birth-rate following the increased death-rate instead of *vice versa*.

17,318. What is the connexion which you suggest between the diminished death-rate and the increased birth-rate?—My suggestion was that the abnormally high infantile death-rate for 1868-72 was the occasion of the high birth-rate which immediately followed. It might have been thought that the high death-rate was occasioned by a high birth-rate, but such is not the case. Table 24 shows that the highest birth-rate was not reached until after the high death-rate of 1868-72 had passed, and after some considerable decline in the infantile death-rate had set in.

17,319. But if you look at the birth-rate in the quinquennia 1858-62, and 1863-67, you will find a very much greater increase of the birth-rate than you do in the quinquennia 1868-72 to 1873-77, do you not?—Do you mean a greater proportion?

17,320. A much greater proportion?—Yes, but there is a still greater rise in the marriage rate, more than sufficient to account for it.

17,321. But that did not follow a higher death-rate in the previous quinquennia but a rather lower one?—It followed a lower one but there was a rise in the death-rate concurrently with the rise in the birth-rate.

17,322. No, in the quinquennia immediately preceding 1858-62 to 1863-67, a lower death-rate is reached than there had been at any time since your diagram begins?—Yes. I do not state to the Commission that this follows as an invariable rule, apart from other considerations, but it has been stated again and again that after a high birth-rate there follows a high death-rate; and I am showing that for the particular years I mentioned the contrary was really the case in Leicester.

17,323. You were suggesting, as I understand, that the high birth-rate had to do with the high death-rate of the previous quinquennium?—Yes, the high death-rate of 1868-72.

17,324. That that had to do with the high birth-rate of the next quinquennium?—Yes. The facts show there was some connection between them.

17,325. I ask why do you come to that conclusion, seeing that in the other instance the rise in the birth-rate, when it is much more marked than in the quinquennium you started with, was not preceded by a higher death-rate, but by a lower death-rate?—I make that observation because the high death-rate of 1868-72 was principally amongst young children, therefore it would be more likely to have that effect, especially as the marriage rate was declining in the later period, whereas for the period you mention it was increasing.

17,326. But when you have, during the period over which your diagram extends, two periods in which there is a marked increase in the birth-rate, and in one of them it succeeds a quinquennium of high death-rate, and in the other it succeeds a quinquennium of low death-rate, is it safe reasoning to a conclusion that there is a connexion between the high death-rate and the high birth-rate which succeeds it?—I think it is safe reasoning when we find that a high birth-rate immediately succeeds a high death-rate, and that there is a fall in the death-rate concurrent with the increased birth-rate; and there is a considerable decline in the death-rate from 1868-72 to the following period. It is a fall from 26.82 in the death-rate for the period 1868-72 to 24.49 per 1,000 for 1873-77, which is a considerable fall. The difference between the death-rate and birth-rate is greater for these two periods than in those referred to by your Lordship.

17,327. And from 1873-77 onwards, in the next two quinquennia, they seem to go concurrently?—Yes. They do practically follow concurrent lines. Perhaps I had better give you the respective details of these rates. The maximum annual average marriage-rate of



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24·78 per 1,000 living is attained in 1863-67, exceeding its periodic average marriage-rate, that is, the average for the 11 periods for 1838-89 by 4·19 per 1,000. The maximum birth-rate of 42·69 in 1873-77 exceeded its periodic average birth-rate by 4·26 per 1,000; the maximum death-rate of 26·82, since 1849, when vaccination was more generally introduced and practiced as shown upon this diagram is 2·45 per 1,000 in excess of its periodic average. The minimum rates are, for births 32·30, or 6·13 per 1,000 below the periodic average, and for deaths 17·39, or 6·98 per 1,000 below the periodic average, and both these minimum rates occur when vaccination had been abandoned. The percentage of diminution represented by the fall from the maximum to the minimum rates is for births, 24·34 per cent., and for the deaths 35·17 per cent., being a percentage gain by diminution of the death-rate over the birth-rate of 10·73 per cent., the fall in the vaccinations during the same period being from 91·7 to 5·1 per cent. to the total births.

17,328. (*Mr. Meadows White.*) There is a fall, but there is no parallel, is there?—Yes, there is a fall, but there is no exact proportionate parallel.

17,329. (*Chairman.*) The highest birth-rate is reached in the quinquennia 1868-72 and 1873-77, is it not?—Yes. The excess of 2·45 in the death-rate per 1,000 for 1868-72 over the periodic average death-rate would mean an annual loss of 228 lives, or a total loss to us of 1,140 lives for the five years calculated on the middle population for that period when vaccination was most rigorously enforced. If the same death-rate prevailed in Leicester now which prevailed in 1868-72 we should be losing 1,402 lives per annum above the present number of deaths, or a total additional loss for Leicester in five years of 7,010 lives. But these lives are being saved as the result of improved sanitary conditions, and improved social conditions, and no part of the saving can possibly be claimed for vaccination. The saving has been achieved in spite of what I must describe as the retarding influence of vaccination as an exciting or predisposing cause of disease and death. The fall in the Leicester death-rate from the five years, 1868-72 to 1883-87, is from 26·82 per 1,000 to 19·88 per 1,000, or a saving of 6·94 for Leicester; while the fall in England and Wales is only from 22·2 per 1,000 to 19·2, or a saving of only 3 per 1,000 for the country generally. The saving of life in England and Wales is equal to about 90,000 a year on a population of thirty millions, but if the saving of life for the whole country had been equal to that achieved in Leicester, it would mean a saving of about 210,000 lives as against 90,000 or a general saving of about 120,000 additional lives per annum. I have here, too, some details of calculations which I have made comparing the death-rate of England and Wales, with the death-rate for Leicester, and I find that in 1838-42 the death-rate in Leicester exceeded the death-rate for England and Wales by 6·09 per 1,000 living.

17,330. On what basis do you make that comparison?—These figures are based upon the Registrar-General's reports for England and Wales, and those for Leicester upon the same basis as that previously described.

17,331. Is that the same basis as the Registrar-General's?—Practically so on the whole. The Registrar-General would make his calculation upon the assumed populations for the year, whereas ours are upon the corrected populations. Speaking broadly, I do not know that there would be any material difference in taking quinquennial periods. In the following quinquennium, 1843-47, the difference is 5·16, that is, the death-rate for Leicester is above that for England and Wales. For the quinquennium 1848-52 Leicester is 26·51, as against 22·6 for England and Wales, a difference of 3·91. In the next quinquennium the difference against Leicester is 2·58; in the next period, 1858-62, it is also 2·58; in 1863-67 the difference is 2·97; and in 1868-72 the difference rises to 4·62, the death-rate for Leicester being 26·82 per 1,000, and that for England and Wales being 22·2. In the following quinquennium, 1873-77, the difference declined to 3·09, and in 1878-82 the difference between the two death-rates is only 1·97. In 1883-87 the death-rate of Leicester was 19·88, while that for England and Wales was 19·2, a difference of only 0·68 per 1,000. Then for 1888-89, the death-rate for Leicester falls to 17·39, while the death-rate for England and Wales is 17·85.

17,332. Did the rate go up a little in 1888?—No, it declines a little even for 1888, but the low death-rate for 1880 brings it still lower.

17,333. (*Dr. Collins.*) Do you happen to have materials for a similar comparison between Leicester and the 27 other large towns?—I have not yet prepared that evidence, although I purposed to do so. It would be very useful, but up to the present I have not had time.

17,334. (*Sir Guyer Hunter.*) What inference do you wish the Commission to draw from this diagram you have placed before them?—I explained at the last sitting that I wished to show that our abnormally increased death-rate for 1868-72 was not due to any annual increase in the birth-rate, but rather that our higher birth-rate was due to our higher precedent death-rate. That was the principal object for which I put in Diagram K.

17,335. So far as I understand this, you say that the highest death-rate is coincident with the highest vaccination; do you believe that vaccination *quâ* vaccination is the cause of the highest death-rate?—I say that since 1849 our highest death-rate is coincident with the highest vaccination period 1868-72. I do not take it generally.

17,336. I do not care what period you take, I want a simple answer to the question. Do you believe that the highest death-rate is the result of the highest vaccination period *quâ* vaccination, that vaccination, in other words, was the cause of the highest death-rate?—I have stated that I do not think it is the only cause of the whole increase of the death-rate, but that it is the probable and predisposing cause of some part of it.

17,337. But whether it is a predisposing cause of some or the whole, what is the meaning of these statements here that the highest death-rate agrees with the highest vaccination?—In point of fact the statements are absolutely true.

17,338. I ask you again to answer my question; do you believe that the high death-rate is the result of vaccination?—I have already given an answer to the question.

17,339. I have not heard you?—My answer is that I do not affirm that the whole of the increased death-rate is due to vaccination, but that some part of it undoubtedly is.

17,340. What makes you eliminate some part? Why some part—why not all?—Because there are other causes for the increased death-rate, to which I have referred before.

17,341. Then there are other causes besides vaccination for the high death-rate?—I have already stated that, there are.

17,342. (*Dr. Collins.*) I think, amongst other things, you showed us a drawing showing some drainage defect which you alleged as part of the cause of the higher mortality?—Yes, our drainage was in a very defective condition at that time.

17,343. (*Mr. Meadows White.*) As I understand, you do not seek to establish any parallelism in the lines; your returns would be against that, but that it would only apply during the quinquennial period, when the highest death-rate was reached?—I do not say that there is an absolute exact parallel between the two, but there is a remarkable coincidence which requires adequate explanation.

17,344. You do not trace any connexion in this sense, that the greater the vaccination it necessarily follows the greater the death-rate?—Not absolutely so, but it does to a very large extent.

17,345. You see the course your red line takes, and the course the death-rate takes, I cannot find any parallelism between them or any connexion between them?—There is no parallelism in the sense of their rise and fall being exactly proportionate and equal, but the connection is shown by the fact that the rise and fall in the curves synchronize to a great extent.

17,346. Is there not a very wide divergence?—No. Dissimilarity perhaps, but not divergence. My statement to you was that the highest death-rate coincides with the period of highest vaccination, shown on this diagram; and this fact I maintain is absolutely true.

17,347. I admit that the lines seem to coincide to some extent?—They do.

17,348. (*Mr. Picton.*) You wish us to infer from the coincidence of the highest vaccination with the highest death-rate that vaccination is not a very life-saving practice?—I do not think it is at all, but the contrary.



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17,349. Therefore your diagram goes to indicate negatively that it is not a preservative of life?—Yes. It does at least indicate that it is not a preservative of life, and in other tables I purpose to introduce I shall show that during that period of highest vaccination the principal part, if not the whole of this increase of loss of life was due to deaths in younger ages. I should like to supplement what I have said by a quotation from an article on small-pox in the 30th Report of the Registrar-General at page 213. Speaking of Dr. Watt, Dr. Farr says: "His researches extended over the 30 years 1783-1812, which he divided into five equal periods of six years each . . . What was still more strange, Dr. Watt found that the proportion of deaths under 10 years of age, to the deaths at all ages, was rather greater in the last than in the first six years. He does not see the smallest ground for the hypothesis that vaccination does 'positive harm' by infusing some peccant . . . humour into the constitution." But in the first period 'when a third of all the deaths under five years of age were caused by small-pox,' a child had the best chance of reaching its tenth year. . . . This is an important point in pathology; and it must be admitted that, although there were defects in his data Dr. Watt succeeds in showing (1) that small-pox was one of the great causes of death in Glasgow down to the year 1800, (2) that the deaths by small-pox were reduced to a fifth of their original number by vaccination, and (3) that the children died in nearly the same numbers as before, but of other forms of disease . . . The compulsory vaccination in England has reduced further the fatality of small-pox, but since 1853 other diseases have so prevailed as to counterbalance the gain under this head. The mortality of children has not declined in a corresponding degree." This is a very important admission.

17,350. (Chairman.) What date is that?—This is from the 30th Report of the Registrar-General.

17,351. That would be the year 1867 I take it?—Yes, it is for 1867. I was about to refer to a question asked me by Sir William Savory with regard to a statement I made concerning the case No. VI. upon page 13 of our Medical Officer's report for 1888, which assumed that the child had suffered from ulceration of the cornea before it had an attack of small-pox. You asked me to produce some further evidence of that. I produced a letter from the medical man, but you still appeared to be of opinion that this did not show the child had suffered from ulceration of the cornea immediately previous to the time when it suffered from small-pox. Another point which was raised was whether the Medical Officer of Health who visited this child knew before he wrote his report that the child had suffered previously to its attack of small-pox.

17,352. (Sir William Savory.) Will you excuse me; the second was not the point; the child may have suffered previously from ulceration of the cornea, but if the child's ulcerated cornea was well at the time it suffered from small-pox, and then during the attack of small-pox ulceration of the cornea developed, the Medical Officer is right in his statement?—Yes; the point was as to whether it was suffering at the time when it began to be affected by small-pox. I wish therefore now to put in an affidavit from the parent of the child proving this to be the case.

17,353. (Chairman.) We do not receive affidavits. If it is necessary we can examine any witnesses. I have learned by experience that of all evidence the evidence least worth paying attention to is the evidence of affidavits. Happily we have now abolished it in courts of justice?—Then I may say that the parent has made a statement before a commissioner to the effect that not only was the child suffering from ulceration of the cornea at the time it was attacked by small-pox, but also that the Medical Officer knew that it was so suffering because he made this observation at the time he visited the patient as to whether the father knew that the child had bad eyes, and he was informed that he did know.

17,354. (Sir William Savory.) But we have no statement from the medical man that at the time the child had small-pox it had ulceration of the cornea. The statement of the medical man was that at some time previously, the child had suffered from ulceration of the cornea?—Whatever the statement contained in the

medical man's letter which I read on a previous occasion, might convey to your mind, his intention was to state that which I have affirmed, namely, that the child was suffering from ulceration of the cornea at the time of its attack by small-pox.

17,355. (Chairman.) How do you know of his intention, from himself?—Yes, from himself. His words in the letter are, "I can certify that the child was suffering from ulceration of the cornea previously to the attack of small-pox"; he means at the time of the attack.

17,356. Does he say "at the time?—Not here in the letter, but he told me so himself.

17,357. (Sir William Savory.) You obtained that letter from the medical man?—Yes.

17,358. Could not you obtain a certificate from the medical man if it were so, to say that at the time the child was affected with small-pox, to his certain knowledge it had ulceration of the cornea. Why should he not write a second certificate, instead of telling you what his intention was?—I daresay he would, if I cared to trouble him again.

17,359. Why does he not?—I had the impression that this solemn and deliberate statement of the parent would be more acceptable to the Commission, and sufficient for the purpose.

17,360. (Chairman.) Do you mean that the medical man admits in his letter that he mis-stated it in his report?—No. They are two different medical men. There is no mis-statement in the letter I obtained from the medical man; but the inference to be drawn on the other hand, from the Medical Officer's report, is that the child suffered from ulceration of the cornea as the after result of small-pox.

17,361. If a statement is made, the natural conclusion from which is something which is not a fact, I should call that a mis-statement?—That is the case with the report of the Medical Officer of Health, but my intention was to clear the matter up as satisfactorily as possible for the Commission.

17,362. (Dr. Collins.) Is there any statement in the Medical Officer's report to suggest that there had been any disease of the eyes before the attack of small-pox?—Not the slightest.

(Sir William Savory.) The Medical Officer has confined himself in that report to the statement of certain facts, but if you consider you have established the fact, I do not wish to press it any further; that will quite satisfy me.

17,363. (Dr. Collins.) I understand you have now produced medical evidence that there was ulceration of the cornea, at any rate at some time or other before the child had small-pox?—Yes, and I produced that on the former occasion.

17,364. (Chairman.) What is the next point to which you wish to direct the attention of the Commission?—I wish now to clear up the question of vaccinations. We have during the last few weeks carefully gone through all the various official vaccination records, namely, the medical returns, the vaccination registers, the vaccination books, and the vaccination accounts from 1849 to 1889; and I have prepared two tables and a diagram so that your Lordship can readily follow me in my evidence on this part of the case. (The tables and diagram were handed in. See Appendix III., Tables 25 and 26; page 444, and Diagram L., facing page 444.) This investigation has entailed an immense amount of labour, and owing to a severe attack of influenza from which I have lately suffered, and which interrupted my attendance before the Commission, I am sorry to say that I have not been able to procure a copy for each member of the Commission, but I can hand in those which I have prepared. I should like to explain the diagram. The solid red curve represents the vaccinations previously given, with the official figures revised to the latest supplemental returns.

17,365. That is the vaccinations referable to the particular years?—Yes.

17,366. Without regard to when they were performed?—Yes; exactly in the way in which they were first given, with these exceptions, that the upper dotted red line at the beginning, and the lower dotted red line at the end of the solid red curve shows the original curve before revision.

17,367. Do you mean that there is no correction needed, except in the quinquennial, 1849-52 and 1883-87?



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--I am explaining that this is the only correction I have made. The correction at the beginning is due to a clerical error of 900 in the figures given in Mr. Chamberlain's Table A., and the alteration at the end is due to including the figures of the final supplementary returns which were subsequently sent to the Local Government Board. I may say that the error of 900 arose through a figure 9 having been originally entered in the medical returns, which was afterwards altered to an 0 without the tail of the 9 being erased. The number was, therefore, entered by Mr. Chamberlain, when calculating his figures, as 1,951 instead of 1,051.

17,368. You mean that in all other respects your previous figures were exact?—Yes, I mean that my figures were represented by the red curve; that represents the figures given before with the two deviations mentioned.

17,369. Do you mean that even on your own figures your curve was wrong before?—No; I simply mean to represent the curve as originally given, with the exception of that fall at the beginning and the slight addition at the end on account of including subsequent supplemental returns which had been sent to the Local Government Board.

17,370. Do you mean that the part of it which is underneath that upper dotted red line is not as you gave it originally?—It is not.

17,371. Do you mean that you find that there being no correction in any other parts, in other parts the curve exactly follows the vaccinations in those years?—Yes, from the vaccination records and the registers as I take them it does. The dotted blue curve represents the actual number of vaccinations which have been paid for by the Guardians from 1849 to 1862 inclusive. Those would be public vaccinations alone, being obtained from the public vaccinators' annual returns. Then from 1863 to June 30th, 1868, inclusive, the numbers include both public and private vaccinations abstracted from the vaccination registers. From the 1st of July 1868 to 1889 inclusive the blue line represents the actual number of certificates of successful vaccinations both public and private for which the Vaccination Officer has received fees.

17,372. Then it is not the actual number of vaccinations paid for to the vaccinator?—Yes, it includes that for each year, as well as the number for which fees were paid to the Vaccination Officer.

17,373. I thought you said to the Vaccination Officer?—The two would be the same as one return includes the other.

17,374. No, the vaccinator would not be paid for private vaccinations if he did not perform them, would he?—No, but the vaccinator would be paid for public vaccinations, whilst the Vaccination Officer would be paid both for public and private vaccinations as they were registered.

17,375. You mean not the vaccinations but the vaccinations paid for to the officer?—The curve from 1868 to 1889 represents the actual number of vaccinations, both public and private, which took place in each year, for which fees were paid to the Vaccination Officer since his appointment in 1868.

17,376. (Mr. Bright.) Then are any of those fees paid to the Vaccination Officer on private vaccinations?—Yes, on all; for every successful case of vaccination, whether public or private, since the Act of 1867 came into operation. The lower dotted red curve at the beginning of the diagram shows the number of vaccinations for 1849–52 obtained from the medical registers. Then in the next three periods it shows the numbers which have been obtained from the vaccination registers, but for 1853–57 and 1858–62 it has been necessary to add the estimated vaccinations for the west district calculated upon the basis supplied by the actual numbers found in the east district, that is to say, according to their respective proportion of births. This calculation was necessary on account of the west district books being destroyed. If your Lordship will look at the diagram you will see that the blue curve covers nearly the same lines as the old solid red curve.

17,377. (Chairman.) I do not quite understand your blue line for the earlier periods, which you say represents the probable number of private vaccinations, estimated at one-fifth of the public vaccinations, which should be added prior to 1868. Therefore the number added by that blue line would be always a fifth of those shown by the dotted blue line beneath it?—Yes, that is so until we get to the years when the returns are complete in themselves.

17,378. That does not seem to be so, because your dotted blue line goes off to nothing at the end; you seem to be adding less and less?—Our last point for the addition is for the period 1863–67. From this point it is obvious that the dotted curve must join the solid curve in the point for 1868–72 for the sake of connexion; hence it runs into the other.

17,379. But the next begins at 1868, and I do not see why you are adding them all between 1868 and 1872. If since 1868 they are included in the thick blue line, why are you adding any there?—I am not. Actually there are none added between the two points of the diagram; the curve goes from point to point, on the upright lines, which represent the quinquennial periods. Then between 1867 and 1868 none are added the dotted curve simply connecting the two points on the upright lines.

17,380. I do not see that. The result would be that if you are right in taking that line up to 1868, and if after 1868 you have the whole of them in the thick blue line there was a fall between 1868 and 1869, was there not?—These are five-year periods, and if we arrive at that point which nearly touches the index line at 80 for the period 1863–67 we must necessarily continue the line to the other point which reaches 91·7 on the next upright line to preserve the continuity of the curve.

17,381. It seems to me that your line would give an absolutely false impression?—I cannot see how that could possibly be the case. I think the diagram cannot be held responsible for such an impression.

17,382. (Mr. Picton.) Between the thick upright lines your curves do not seem to signify anything for the individual years but only for the quinquennial periods?—Yes, that is all. Five year periods only.

17,383. (Chairman.) There ought to be really some spaces off there?—The intervening spaces between the upright lines mean nothing in point of time. We spread them out in order to get the diagram more distinct at the beginning. The difference between the solid and the dotted blue curves for the four first periods represents one fifth of the public vaccinations added as the assumed number of private vaccinations, making one sixth of the whole.

17,384. We have some ground for doubting whether the one fifth was a proper proportion?—Yes, we have some ground for doubting that, but I put that curve on, and your Lordship will see that it runs on very nearly the same lines as the curve in my original diagram.

17,385. Then what is your table?—Table 26 gives the figures which are represented by the solid blue curve on the diagram. Table 25 gives the figures represented by the red curve on the diagram.

17,386. Table 26 gives for the years 1868–72, 17,728 vaccinations, per-centage of vaccinations to the total births 91·7?—Yes, that is the actual number of vaccinations irrespective of age.

17,387. And your table gives for the next period, 1873–77, 18,062 vaccinations, and the per-centage of vaccinations to births is 80 per cent. only; how is that?—That is in consequence of the greater number of births, which reduces the per-centage.

17,388. There being more vaccinations, was there such a difference in the births as to reduce it from 91 to 80 per cent.?—Yes.

17,389. What are the figures for it?—The 18,062, the vaccinations for 1873–77, are not very much above the 17,728 for 1868–72, while the births for 1868–72 are 19,291, and for 1873–77 they are 22,625. From one point of view the solid blue curve in Diagram L. represents, to my mind, what is nearer the absolute truth than any other method of distributing the vaccinations which could possibly be adopted, because in the first four periods allowance has been made in it for the number of private vaccinations which took place. From a pro-vaccinator's point of view it would also be fairer, because it gives the exact number of vaccinations which actually occurred in each year. Consequently it represents the exact amount of protection which might be assumed to arise from the registered vaccinations which had been performed. Now, in the solid red curve we get a number of vaccinations attributed to each year which really do not take place until after the year has expired. That is to say, taking the births for the year 1872, some of the vaccinations credited to 1872 would not take place until 1873, 1874, 1875, or even the following year; but the blue curve, including the dotted blue line



for public vaccinations, shows the exact number of primary operations both public and private performed within each year irrespective of age. One of the principal objections raised against the former figures, namely, those of Mr. Chamberlain was due to the official mode of distributing the vaccinations. For instance, taking the year 1866 on that basis, out of more than 1,600 vaccinations credited to that year, I now find that no less than 519 took place in 1867 and subsequent years. Again, in 1872, out of over 3,500 vaccinations credited to this year more than 800 took place in 1873 and the following years. On account of the small-pox epidemic the proportion of "deferred" vaccinations would be much smaller in 1872 than in the other years. In reply to your Lordship and Dr. Collins, I gave similar examples in answer to Questions 16,715, 16,752, and 16,753. Then prior to 1868 we had a number of vaccinations upon the registers of persons born in the previous years, so that the registers and the returns to the Local Government Board do not give the absolute truth at all as that blue curve gives it.

17,390. (*Dr. Collins.*) Your blue curve shows the vaccinations in any given year of children whenever born?—Yes, the solid blue curve shows the vaccinations in any given year of persons whenever born. Had I brought the dotted blue curve, in the first instance, before the Commission, I should have been open to this serious objection, that I was attempting to show prior to 1868 that a very low amount of vaccination, comparatively, was performed. As the amount of vaccination represented by the dotted blue curve up to that date shows only public vaccinations, I should probably have then been accused of leaving out the private vaccinations, or at any rate of taking no account of them whereas after that time I had put the public and private together.

17,391. (*Chairman.*) How did you arrive at the point up to which you draw your line for 1868-72?—I arrived at that by taking the actual number of vaccinations paid for, as I explained before, and the number of births, and then making my calculations.

17,392. This is not taking it in each year; you simply find that point and the other point, and then draw the line between them; what leads you to place the upper point where you do?—I added together the number of vaccinations and the number of births, and then took the respective per-centage of one to the other.

17,393. For five years?—Yes. All the upright lines on this diagram represent quinquennial periods.

17,394. You get this point, and you then draw the line to it; but what enables you to get this point?—That point shows the average annual per-centage of vaccinations for five year periods; and gives the actual relation of the number of vaccinations performed to the number of births for the five years.

17,395. (*Mr. Picton.*) It is about 91 per cent. in the year?—To the births, but not of the births; they are persons at all ages, but nearly all children, probably 98 or 99 per cent.

17,396. (*Chairman.*) Do you take the per-centage of vaccinations to the births for each year, and then take the average?—Yes.

17,397. You did not take all the births for five years and then take the average?—No, we have taken the births for each year and calculated the vaccination rates, then added them together and divided by five.

17,398. (*Chairman.*) This represents the average rate for the quinquennium?—Yes, the average annual rate for the five years.

17,399. Not what it had reached at the end of the quinquennium?—No, or it would have reached a still higher point than 91·7. I had intended to explain that each point reached is the average annual of each quinquennium. It is a matter of indifference to me which method I adopt, but I wish the Commission to know exactly the basis upon which these curves are drawn, and if your Lordship or the Commissioners have any preference for either one way or the other I shall be very pleased to adopt it. I think this blue curve fully establishes a statement that I have repeatedly made before the Commission to the effect that I was rather under the actual number of vaccinations than above, with the exception of the first period, which was due to an error in the official tables and not to any calculation of mine.

17,400. You have added one-fifth for the year 1868, I understand?—No, I have added nothing for 1868.

17,401. Does the payment for all of them begin in 1868?—The payment begins on the 1st of July 1868 to the Vaccination Officer for private as well as public vaccinations. We have divided that year and taken the numbers that were paid for from the 1st of July. For the first half of 1868 we have abstracted from the vaccination registers the numbers for which the Medical Officers were paid, and in the last half of the year the total number for which the Vaccination Officer was paid.

17,402. But would it be the same thing whether you take what the Medical Officer was paid for or whether you take what the Vaccination Officer was paid for?—Not exactly. Finding that would probably be below the mark for the early part of 1868, we have gone through the registers and extracted from them the actual number of vaccinations registered from the 1st of January to the 30th of June or the first half of the year.

17,403. Would that include the private as well as the public?—Yes, it would include the private as well as the public. Then for the last half of the year we have taken the number the Vaccination Officer was paid for, which also includes both.

17,404. Then the first part of the year is taking part of your red line and not your blue line?—Yes, just the first half of the year would have been, if we had not added the number from the registers. It would be impossible to show the first half of a year out of five.

17,405. Still one ought to know the basis upon which it is taken, but after 1868 the blue line is taken exclusively from the amounts paid to the Vaccination Officer, is it not?—Yes, it is, from the 1st July 1868.

17,406. (*Professor Michael Foster.*) Does that include re-vaccinations?—It does not include re-vaccinations.

17,407. Primary vaccinations only?—Yes, primary vaccinations only.

17,408. (*Chairman.*) Does the blue curve include those that we have called the "extra" or "special" vaccinations that were left out?—It does include the extra vaccinations, for 1863-64.

17,409. The blue line does, all of them?—All the vaccinations from 1868, but it would not include them all before.

17,410. Why not?—Because the solid blue line before was taken from the Medical Officer's register and not from the vaccination registers, and there are no "deferred" vaccinations in the medical registers.

17,411. (*Professor Michael Foster.*) I understand the blue line up to 1868 is something different from what it is afterwards?—The dotted blue curve up to 1868 represents public vaccinations only, the solid blue curve represents both public and private. The space between the blue curves prior to 1868 shows the additions for private vaccinations.

17,412. (*Chairman.*) If those special vaccinations were public, why should they not be included before 1868?—Whatever vaccinations are included in the medical registers are included here. The "extra vaccinations" for 1863-64 are included in both the solid and the dotted blue curves.

17,413. What do you call the medical register?—The register kept by the Public Vaccinators, or parish doctors, and from which they compile the annual September returns of public vaccinations of persons under and over one year of age.

17,414. They can be got for some of the years at all events, can they not, from the register which is kept?—In the vaccination registers I can trace a large number of the dates of births, but not all of them. It is impossible to trace some of the entries of the Medical Officers' registers to the vaccination registers. They are two entirely distinct sets of books.

17,415. In one period particularly, 1863-64, you told the Commission that there were nearly 4,000 extra vaccinations; are those 4,000 extra vaccinations shown in the blue line or are they not?—Yes, they are shown in the blue curve. There are also a number of entries in each book which we have been in the habit of calling "deferred vaccinations" or "deferred entries," and they are shown in the table and also on Diagram L. in the solid blue curve.

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*Sir James Paget took the Chair.*

17,416. (*Chairman.*) What would be your next point?—I do not know whether the Commission is satisfied with the explanations offered as to the various methods of dealing with the vaccination statistics; but after the laborious investigation of the registers which I have undertaken I think I am fairly entitled to ask for some direction as to which set of figures the Commission would prefer me to use, because it is inconvenient to put any tables in until this point is settled. I have a set of figures upon the tables, but if the Commission prefer those represented by the blue curve I am perfectly willing to adopt them. It is a matter of perfect indifference to me which set of vaccination figures I use, as they both support the arguments I have advanced before the Commission. Then I have some further diagrams to put in and I want to place the vaccination curves upon them.

17,417. (*Mr. Picton.*) Does not the blue curve show the actual number of primary vaccinations?—Yes. It shows the actual number of vaccinations at all ages.

17,418. Both public and private?—Yes, both public and private. There is this singularity about the dotted blue curve. It represents the public vaccinations only, and had the curve been continued after 1867 to show public vaccinations alone, the Commission would have seen that there was a very much smaller proportion of public vaccinations in the later periods than in the earlier years. One explanation of this is that some private vaccinations which took place in the earlier period from 1849 to 1868 had also been entered in the vaccination registers as public vaccinations, and that therefore the Public Vaccinators had been paid fees for them as public vaccinations, in addition to whatever they might also have received in private fees. If this is not so, and an addition had to be made for private vaccinations to equal the proportion existing for later years it would bring the solid blue curve up very much higher for the first four periods.

17,419. (*Sir William Savory.*) If you compare your two Diagrams J. and K., I take it that each would show the proportion between vaccination and the death-rate. In Diagram K. are set forth quinquennial periods of vaccination and deaths. I suggested that it would be fairer to set forth the relation year by year, and you referred us to Diagram J. for that. Now Diagram J. gives one a very different impression with reference to your statement that the highest death-rate is coincident with the highest vaccination periods from what Diagram K. does. Diagram K. seems more to correspond with that than Diagram J., and that is the point I wish to bring out. There is not the amount of uniformity in Diagram J. that there is in Diagram K. between the vaccination rate and the death line?—Do you mean that the black curve which represents the deaths seems to go up higher at the period when there is no vaccination shown at all?

17,420. Yes?—For odd years that is so; but no one can fairly base an argument on single and detached years, especially as the death-rate in the earlier periods is found to be more erratic than it is later on, but if you take the five years together—

17,421. That is my objection?—I cannot see any force whatever in the objection. It is unstatistical.

17,422. I will not press it further; I will only repeat that I think a yearly rate sets it forth more clearly and thoroughly than a quinquennial rate?—But I have given both for your consideration; in every case I have given an annual table as well as a quinquennial one, so that whoever is able may go into the very closest details. Nothing can possibly be fairer than this.

17,423. That is not quite the question. Anyone taking up a paper like this and looking at it, and not going thoroughly into the question, would say: "The relation between the vaccination rate and the death-rate is very startling": there is no qualification; there is no explanation; there is nothing said about "pre-disposing cause," there is nothing said about other causes coming into operation; but as the table is printed it simply sets forth what appears to be a startling fact. I quite understand your explanation, and if one goes into the matter further and deeper the inference is considerably qualified, but what I submit is that a table like this should not be misleading even by itself?—No doubt the facts are startling, but I have had no intention to make them misleading. I submit that the

table shows the actual facts, and therefore cannot in any sense of the term be misleading.

17,424. It shows facts, but not the whole of the facts?—It shows the whole of the facts to which it relates.

17,425. Excuse me, it does not; it assumes to show the relation between vaccination and deaths; it may be the truth, but it is not the whole truth?—I prepared it to show the relation between vaccination and death; in fact this was my principal object. It is impossible to get the whole thing in the way you suggest upon one diagram. What I ask the Commission to do is not to consider any single diagram by itself but to consider the whole set together.

17,426. (*Mr. Picton.*) I wish to ask you whether I am correct in interpreting your idea with reference to quinquennia in this way, that regarding vaccination as only one amongst numerous causes affecting the death-rate you think its operation can best be perceived over a number of years, and not over each year?—Yes, unquestionably. I think it is not only fairer in regard to vaccination but I think it is fairer with reference to other causes. Take the effect of sanitary works which are carried out in any one year. You cannot expect them to have so much effect in lowering the death-rate in that year as they would have in the next year after the work is accomplished and complete. Therefore I venture to think it is fairer from every point of view to take five-year groups, rather than attempt to base a general argument upon odd years.

17,427. (*Chairman.*) Would there be any objection to adding on some of these tables what you have shown on one, namely, the number of the sanitary orders in the year?—It could be shown whenever it was applicable.

17,428. It would be useful as showing an effect of one of the influences that were at work in diminishing the death-rate?—It could be added, wherever relevant to the subject referred to by the table.

17,429. Your table, as Sir William has just pointed out, does not do that; it looks like implying, though I do not suggest that you meant it, that the diminution of vaccinations was the only influence in diminishing the death-rate?—I would be willing to add that. I have never even suggested that the diminution of vaccination was the only cause of our diminished death-rate. On the contrary, I believe this is due in a large degree to our improved sanitary conditions, of which I certainly regard the absence of vaccination as one.

17,430. (*Mr. Bright.*) The main sanitary improvement, I suppose, would be the introduction of a new sewerage system?—Yes, that would be the main sanitary improvement.

17,431. How would it be possible to represent that in a curve?—It would be impossible to show the operation of any such sanitary measures as sewerage works on a diagram, but their effect would be seen in a diminished death-rate. We could show upon a table or diagram the number of sanitary orders that were issued as representing the comparative activity of the sanitary authority.

17,432. (*Chairman.*) That is a considerable fact, surely?—It is undoubtedly, and worthy of more consideration than it has hitherto received.

17,433. And that might be shown upon all the tables which would otherwise seem to imply that the diminution of vaccination was the only influence that has been at work?—I am quite willing to add them, especially as a disposition is now evinced to acknowledge the influence of sanitation in this matter.

17,434. (*Professor Michael Foster.*) But are not your sanitary orders generally provoked by some kind of disease?—The increased activity that was going on directly after the small-pox epidemic of 1872 was induced by the epidemic, but the increased activity at present is not so at all.

17,435. In the majority of cases the issue of sanitary orders is in consequence of some complaint brought to the notice of the authorities on account of some cases of illness?—Not altogether, as systematic inspection is carried on by our sanitary officers, but I have no doubt complaints would tend to increase the number of orders issued.

17,436. So that the number of sanitary orders issued is dependent upon the amount of disease?—Not necessarily so, although it would influence them to some extent, especially in the earlier years of sanitary operations.



17,437. (*Dr. Bristowe.*) Do you consider that Tables 23 and 24 prove that the diminution in vaccination has caused a diminution in the marriages and in the births as well as a diminution in the deaths?—I am afraid that is a question I must leave the Commission to exercise its judgment upon. My intention in putting them in was only in reference to its influence upon the deaths.

17,438-9. (*Dr. Collins.*) I suppose you have fully considered both your annual and your quinquennial diagrams. Have you found any reason from a consideration of the annual diagram to correct any of the conclusions you have put to the Commission upon your quinquennial diagram?—Not any at all. I have given great amount of consideration to them all, and have done my utmost to make them represent the truth, and consider the quinquennial diagrams the fairest to use any relevant argument upon.

17,440. (*Sir William Savory.*) Would you say that the two forms of diagram, the quinquennial and the annual, convey precisely the same impression to an impartial observer?—If they are analysed closely they would, because if you are alluding to the high death-rate which prevailed in 1868-72, you will find the whole of the five years were very high indeed, although one of them tower above the others, so conspicuously as some of the odd years in the earlier periods.

17,441. But a quinquennial period would not offer the same opportunity for analysis as an annual one?—It would not. But the quinquennial diagrams give a much fairer, and a far more comprehensive view, and this is why I have given them all in both forms.

17,442. (*Chairman.*) If your quinquennial period had been 1865-69 it would have been very different, would it not?—I am not sure that it would. But as I stated I have divided the quinquennial periods according to the Act of Parliament of 1867.

17,443. But with reference to reckoning the progress of any disease, it is rather important which five years it chances to bear on?—There is no doubt that would affect it to some extent, but in the preparation of this evidence, I have been guided by the passing of the penal Act in 1867.

17,444. The defect which that implies or shows in taking quinquennial periods does not occur in taking annual periods?—I fail to see any difference, because if you divide into any quinquennial periods, for example, if you take the half decennial periods which are adopted by the Registrar-General, you are simply adopting an arbitrary division, and in that respect one division does not differ from another. But my division is fully justified by the altered conditions in respect to vaccination introduced by the Act of Parliament.

17,445. I do not think the Registrar-General is exactly correct, but there are necessarily defects in any system which takes a series of years instead of year by year?—There may be defects in any system of arranging years; but I consider that it would be a much more serious defect to decide upon this question without taking a more comprehensive view of the subject than can be obtained by merely considering odd and separate years.

17,446. If you were to take, as I say, from 1865 to 1869, the average would be very different from that which appears when you take 1868-72?—Possibly it would affect it to some extent.

17,447. Therefore surely it would be better for accuracy to have it an annual record?—I do give it both annually and quinquennially.

17,448. But in the table which you are proposing to send in, you take quinquennial periods?—The table to which I think you are now alluding I have prepared simply for the Commission to see the difference between the two methods of calculation. Whichever method is finally adopted, I shall hand in both annual and quinquennial tables and diagrams based thereon.

17,449. Would it not be best that we should have both lines, solid red and solid blue, and annual instead of quinquennial?—During the past few weeks a number of questions have been addressed to me at different sittings of the Commission, and the suggestion has been frequently thrown out: "Of course that answer depends upon the amount of correction you find necessary in the vaccinations." I have been hard at work night and day to prepare these diagrams at the request of the Commission, and I think now I have prepared them in several ways, it is due to me that I should have some definite direction as to the manner in which the Commission prefers them to be used in

future, because exception having been taken to the way first adopted—although based upon official figures—I do not wish that any objection should be taken again. I am desirous as far as possible to meet the wishes of the Commission and any reasonable suggestions, as I am anxious to proceed with my evidence, and to complete my tables and diagrams.

17,450. Would not that objection be overcome if you adopted both methods and expressed upon the diagram what each method means?—I could do that, if it would represent the case better, but it would add enormously to the labour, and I am afraid your suggestion would complicate the diagrams and make them misleading and very confusing.

17,451. Taking this one, Diagram L., alone that you have put in to-day?—That diagram represents the outcome of my investigation; it is not a diagram I intended putting in at first; it is only an illustrative sketch to show the Commission the difference between the two methods of distributing the vaccinations.

17,452. (*Dr. Collins.*) I would put it to you if you decide to adopt one or other and not both, whether you would not think it desirable to put in this Diagram L. to show what difference there is according as either is adopted?—I think it would be a good plan and I am quite willing to do so: it shows the difference between the two sets of figures; and also the difference between taking the vaccination rate upon the births, and the population.

17,453. (*Chairman.*) I think you had better adopt your own plan for preparing your tables, adding your own explanation to it. Whoever reads the evidence will be able to understand them. What is the next point to which you wish to direct the attention of the Commission?—At this point I would ask the Commission if it would be convenient for them to adjourn at the present moment because I have no finished diagram or tables printed, as I have been awaiting any decision which the Commission might come to upon the question which has been brought before them this afternoon. I can, however, go on with the tables in manuscript if the Commission please.

17,454. (*Chairman.*) I think that would be the better way?—The next tables I wish to submit for the consideration of the Commission are those relating to the deaths and death-rates under different ages. These rates are given on the total population. Table 27, which I will now hand in, gives the annual number of registered deaths from all causes, under consecutive life periods from 1838-1889. (*The table was handed in. See Appendix III., Table 27; page 445.*) In 1868, the first year of penal enforcement of vaccination, there is a great and disproportionate increase of deaths of infants under 3 months, from 3 to 6 months, and from 6 to 12 months, and this increase continues for several years, practically for the ten years when vaccination was so rigorously enforced. The actual number of deaths are only about the same in 1889 as in 1868, notwithstanding the great increase of population. The next table, which I will now hand in is an annual table which gives the rates for the absolute numbers contained in Table 27, and an additional column showing the per-centage of registered vaccinations to total births from 1849 to 1889. (*The table was handed in. See Appendix III., Table 28; page 446.*) In 1868 the first year of penal enforcement of vaccination, the death-rate of infants under 3 months is higher than in any year in the whole range of 52 years. 21 years later (in 1889) with scarcely any vaccination there is a saving of life amounting to over 2 per 1,000 for infants under 3 months. The death-rate of children from 3 to 6 months is higher in 1868 than in any preceding year since 1838, but the maximum death-rate from 3 to 6 months is reached in 1872, one of the years of the highest vaccination period, when the death-rate per 1,000 rose to 3·12 for this age. The per-centage of vaccination to total births was at this time over 90 per cent., while when the per-centage of vaccinations to total births had fallen to about 5 per cent. in 1888-89, the death-rate of infants from 3 to 6 months had fallen from 3·12 to 1·72, showing a saving of life at this age of 1·40 per 1,000. For infants from 6 to 12 months, the first year of penal enforcement of vaccination, 1868, shows the highest rate of mortality experienced from 1838 up to that time, and this high rate of mortality is only exceeded by one year, namely, 1875, which was a very fatal year for zymotic diseases in Leicester, and also a year when the per-centage of vaccinations to births was very high, being 82·6 per

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cent. to total births. The vaccination rate had fallen in 1889 to only 3·6 per cent. and the death-rate for children from 6 to 12 months had also fallen from a maximum of 3·43 per 1,000 in 1875 to only 1·95 in 1889, showing a saving of 1·48 per 1,000 at this age. From the age of 1 to 5 years the death-rate is somewhat erratic; 1840 has an excessively high rate, so have 1845, 1852, 1857, 1858 and 1863. The death-rate for each of these six years is higher than any year since 1863. Nevertheless a high rate of mortality at this age of 1 to 5 years prevails from 1868 to 1872, the period of highest vaccination, especially when compared with the years subsequent to 1882; a very high total death-rate at all ages also prevailed during the same period.

17,455. In your Table 28 the death-rate of all ages over 15 was surely very high in 1868; in 1869 it is still higher?—The death-rate for over 15 years of age was declining; although it was higher for the year 1869 it was lower for 1868 than during the preceding five years; in fact, it was lower than the rate found in almost any year previously, since 1838.

17,456. No; the years 1874 and 1875 were both higher and also 1879. The year 1868 was evidently a very unhealthy year altogether, not merely for those under one year, but for all ages?—The years you mention are after 1868, but in that year the death-rate was high for all ages, especially in the younger ages, as I think you will find on reference to the table. Table 29, which I will now hand in, gives the average annual registered deaths from all causes in quinquennial periods for successive life ages from 1838 to 1889 with the average annual per-centage of registered vaccinations to total births from 1849 to 1889. (*The table was handed in. See Appendix III., Table 29; page 447.*)

17,457. Here, again, is there anything like a proportion between the variations in the vaccination and the variations in the birth-rate?—No, the rates are not mathematically proportionate; I have never maintained that they are. My next table gives the average annual death-rate from all causes per 1,000 of the population in quinquennial periods during the years 1838–89, for the ages named in the table; and also the average annual per-centage of registered vaccinations to total births during the years 1849–89. This table (Table 30), which I will now hand in, is similar to Table 28, but is grouped in five-year periods; and it will be seen from Table 30 that the average annual death-rate of children under three months for the seventh period or period of highest vaccination (1868–72) was 4·35 per 1,000, while for 1888–89 it is only 2·72, showing a saving when vaccination was rejected of 1·63 per 1,000. (*The table was handed in. See Appendix III., Table 30; page 447.*) Comparing the same periods from three to six months of age the saving of life is 1·04 per 1,000, while a further saving of life is effected in the ages from six to twelve months of 0·74 per 1,000.

17,458. In the period from three to six months, there is a very low mortality previously to 1868?—There was then a low mortality, but the maximum death-rate from three to six months is reached in 1868–72.

17,459. It is now very nearly on an equality with what it was before?—Are you alluding, may I ask, to Table 30?

17,460. Yes. In reference to vaccinations, although they reach their highest in 1868–72, yet they were going on to a considerable extent in the years previously and in those years the mortality between three and six months was very low?—It was low but there was a cause for that which to a very large extent accounts for it; the continued high comparative infantile mortality at those ages in the later years was to a very large extent due to the factory system which is in vogue in Leicester, and which did not prevail to the same extent in the earlier years.

17,461. Would it not be well if you could put in an estimate so far as you know of all the causes which may have contributed to alter the mortality?—I do not think it would be possible for anyone to do that.

17,462. But why should that affect the children from three to six months of age? Then, again, there is a considerable rise from six to twelve months?—The factory system now affects children at all ages especially infants, but in the early periods the condition of the people in Leicester was better in this respect, because to a very large extent the parents worked at their homes, and thus they would be better able to attend to their children. In the earlier periods, the population of Leicester was more like that of a large village than that of a manufacturing town. At

the present time a great many mothers especially of the artisan class, work in factories, and we see the result in the still comparatively high death-rate of the infantile population.

17,463. Does that coincide with the climax of vaccination?—I do not know that there is any coincidence between the two; the influence of vaccination is apart from that altogether. Had it not been for vaccination instead of the infantile death-rate rising to its maximum in 1868–72, it would in all probability with the increase of the factory system have reached the maximum some years later.

17,464. One wants very much to know if it is possible to estimate what is the influence of vaccination as you suppose in increasing the mortality. How can we separate the influence of vaccination from the influence of the factories?—It is a distinct influence altogether, although I regard them both as deleterious. But to separate and apportion to each its particular results would, I think, be an impossibility for any one.

17,465. Is there any evidence by which you think you can separate them by some distinct means?—I think there is general evidence, to a very large extent.

17,466. (*Sir William Savory.*) What do you mean by general evidence?—I mean by general evidence that if we take the death-rate spread over the whole group of years with which I am dealing, we are able to see the effect of different causes on the death-rate at the different ages and also upon the total mortality.

17,467. But where can we see it?—On my diagrams and tables in the increased or decreased death-rates.

17,468. Not unless you show the increase or the decrease of it to be due to a particular cause?—We know the death-rate is due to some cause or causes. If at a given time there is a distinct rise in the mortality, especially at the younger ages, it should lead us to inquire as to what particular causes were then in operation. One of the causes existing at the time of our very high general death-rate, and of our highest small-pox, zymotic, and infantile death-rates, we find to be vaccination, and in consequence of this fact we are justified in attributing some part of the increased mortality to that cause, especially since it is admitted not only by honourable members of the Commission, but by other authorities, one of whom I have quoted to-day, that vaccination has a distinctly injurious effect.

17,469. That is altogether outside the results of your statistics; you do not show that vaccination is one of the causes, you say that vaccination is concurrent with a certain number of deaths for which you admit other causes outside vaccination, therefore the tables do not establish that vaccination is the cause of death?—I admit that there are other causes, but not all operating at the same time; and it is a singular coincidence requiring adequate explanation that at the period of the highest vaccination we have this highest death-rate prevailing amongst those very ages in which it is alleged that vaccination saves life, and further when vaccination is abandoned the number of deaths for these self-same ages declines.

17,470. (*Mr. Bright.*) You do not think that at that time when vaccination may have acted as the cause of infant mortality there was any increase in the system of mothers working in factories or going to work very nearly up to the time of their confinement?—There would be some increase on the previous years but not to the extent which has prevailed since our vaccination rate has declined.

17,471. But I understand you to say that since the year 1872 those causes connected with the working in factories have increased instead of diminished?—They have increased up to the present day, whereas the death-rate has declined.

17,472. The death-rate which you attribute to some extent to vaccination possibly has declined?—That is so, notwithstanding that the factory system is more in vogue to-day than it has been at any previous period in Leicester.

17,473. (*Professor Michael Foster.*) Has it not been met by the action specially directed against insanitation?—There is no doubt there have been Factory Acts directed towards the making of factories more healthy.

17,474. Was it not the acknowledgement that the factory system was prejudicial to infant life which led to efforts upon the part of the town to prevent the



ill-effects?—To a certain extent, but the increased employment in factories would probably militate in some degree against any saving of life arising from improvements consequent upon Acts of Parliament.

17,475. (*Mr. Bright.*) Are you aware of any alteration in the Factory Acts about this period which would tend to the saving of infant life?—I am unable to give you the dates of the Factory Acts or to say what the influence was.

17,476. (*Dr. Bristowe.*) May it not be argued from your table that the factory system has saved life?—I do not know that it could be argued from the table particularly, but I should think if the assertion were made that the Factory Acts had resulted in the saving of life it would be perfectly true.

17,477. I said not the "Factory Acts," but the "factory system"?—I do not think that could be argued. I have never known anyone to assert that factory life was beneficial to health.

17,478. (*Professor Michael Foster.*) Do not your tables show that the increase of the factory system is coincident with diminished mortality?—The tables show that the infantile mortality for 1888–89 is very little below that of 1838–42.

17,479. (*Chairman.*) Was the factory work then being carried on to its full extent?—In the earlier period scarcely at all in Leicester.

17,480. Then surely it would appear, as Professor Michael Foster suggests, that with the increase of factory work there has been a diminution in the mortality from three to six months?—There has been a considerable diminution in the mortality from 1868–72, but even now our infantile mortality is scarcely so low as that of many of the preceding periods.

17,481. There is a diminution in the mortality from three to six months in the same proportion as there is in the mortality under three months, which you are disposed to assign to the diminution of vaccination?—There is a diminution in all from the period 1868–72.

17,482. Therefore one may say that with the factory work there has been a less mortality?—I do not think any one could say that seriously, because such a statement would probably be regarded by most people as exactly contrary to the truth.

17,483. But there is the same diminution of mortality occurring under the factory system as occurs under the diminished vaccination?—There is a diminution, but in making a statement of that kind, one would require to have some regard to the probabilities of the case. In regard to factory employment I think it is well known that it is detrimental to health, and that it has been still more so in the past. It is not so detrimental to health now owing to modern improvements in the factory system, and the improved sanitary condition of the buildings in which the work is performed.

17,484. (*Mr. Picton.*) You mean it cannot possibly be good for a baby from six to eight weeks old to have its mother go out from 10 to 12 hours a day?—Yes. No doubt it is extremely detrimental to the health of the child.

17,485. (*Mr. Bright.*) And also that the mother should work till within perhaps two hours before the child is born, which is very often the case?—Yes. Such occurrences doubtless have an untoward influence on infantile conditions of life.

17,486. (*Chairman.*) Rightly or wrongly some people say it is extremely improbable that vaccination would increase the mortality, and you are trying, by the result of these figures, to show that it does?—Yes, and my opinion in regard to injurious effects of vaccination, strongly supported as it is by the tables I supply does not stand alone upon this matter. Here is a quotation from a text-book of medicine by Dr. Niemeyer, of Tübingen, published in 1879. He says, "It cannot be denied that vaccination sometimes endangers life, and in other cases leaves permanent impairment of health, especially cutaneous diseases and other scrofulous affections due to the debilitating influence of the fever accompanying the vaccinia," so that my opinion in respect to injurious effects of vaccination is upheld by medical testimony.

17,487. (*Sir William Savory.*) You could hardly say it is upheld by medical testimony, it is upheld by the statement of some medical man; but the great bulk of medical testimony is opposed to it?—There are a very large number of statements made by medical men who

especially emphasize the detrimental influence which vaccination has upon the health of children.

17,488. Upon such a subject as vaccination which is so continually and popularly discussed, you get all sorts of opinions from all sorts of people, it is not quite fair to quote the opinion of some particular doctor and speak of it as medical testimony?—I give it as one of many medical opinions.

17,489. (*Professor Michael Foster.*) Are you aware of the careful Hungarian statistics which have been collected upon that point by Körösi?—I have heard of them, but I do not now remember them particularly.

17,490. Are you not aware that they showed very conclusively the reverse of that which you state?—No, I am not aware of that. On the contrary I have heard that they are untrustworthy and worthless. In my Table 50, for the ages above 15, to which Sir James Paget has just alluded, there is an almost regular and continuous decline observable in the all cause death-rate. The decline is continuous from period I. to period V., but is broken by a slightly increased death-rate for period VI. Period VII., 1868–72, when vaccination was highest, gives the highest death-rate at all ages since 1849, when vaccination became more generally practised, and these five years supply the highest average death-rate for a range of 42 years extending backwards from 1889.

17,491. (*Chairman.*) Have you found that fact confirmed in other towns?—I have not examined the statistics of other towns except so far as I have come across them in the Registrar-General's reports. I do make some comparison between the death-rates for those ages on the proportional populations with which I purpose dealing later on. Table 31, which I will now hand in, gives the annual registered deaths from all causes under different life ages and is similar to Table 27, but this is an inclusive table of absolute numbers, that is to say, the whole of the deaths are included under each age named in the table. (*The table was handed in. See Appendix III., Table 31; page 448.*) Being inclusive of the numbers at all the various ages it shows more plainly the fatal character of those years when vaccination was most vigorously enforced. My next table gives the annual death-rate from all causes, per thousand of the total population, under the same life ages as those named in Table 31; namely, the death-rate under three months, under six months, under 12 months, under five years, under 10 years, under 15 years, and the total death-rate at all ages, 1838–89. It gives also the annual per-centage of registered vaccinations to the total births, 1849–89. (*The table was handed in. See Appendix III., Table 32; page 449.*) From this table, we find that in 1868, the first year of the penal enforcement of vaccination, each death-rate under three months, six months, and 12 months reached its maximum, while the fall in the death-rates at all ages from 1868 to 1889 is enormous. Under three months of age the decline is more than two per 1,000, under six months it is about three per 1,000 and under 12 months the fall is more than four per 1,000. The death-rate under five years of age also reached a maximum in 1868 (after the slightly higher year of 1840), and the saving of life between 1868 when vaccination was rigorously enforced and 1889 when vaccination was in abeyance is more than eight per 1,000 of the total population. The death-rates under 10 years of age and under 15 are also very high in 1868, and show a fall respectively from 1868 to 1889 of over eight per 1,000 under 10 years and nearly nine per 1,000 under 15 years.

17,492. The highest rate from all causes according to this Table 32, both for under three months, and indeed for all ages, is in 1868?—Not for all ages; under three, six, and 12 months and five years; but under 10 years the death-rate is exceeded in 1863.

17,493. I mean taking the period of the highest vaccination you speak of, beginning with 1868, the highest death-rate is not at the very highest point of vaccination. In 1868 vaccination was less than in 1869 and 1872?—You are speaking of the death-rate at all ages, I presume?

17,494. Yes?—The death-rate at all ages is slightly lower in 1868 than for several odd and exceptional years which preceded 1868.

17,495. But the question is whether the highest mortality was reached during the period of highest vaccination?—Yes, and I have already stated that such

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is the case with the exception of about the first 10 years; when we are unable to estimate the effect of small-pox inoculation upon the mortality of that period. The average annual death-rate reached during the first 10 years 1838-47 is slightly higher than that from 1868-72, being 27·77 for the former period and 26·82 for the latter.

17,496. But in the quinquennial period 1868-72 the highest vaccination was, according to your table, in 1872?—Those five years were all years of high vaccination.

17,497. But the highest death-rate for every age, is in 1868?—In those five years that is so; I thought you were also alluding to other years.

17,498. That shows us at least the advantage of having annual returns?—I have always given annual returns all through my evidence.

17,499. But it has been always implied that 1868-72 tells the proportion between the highest vaccination rate and the highest death-rate. If you break into your period it shows the highest death-rate in 1868, whereas the highest vaccination rate was in 1872?—But let us apply the same principle to the supposed protective power of vaccination to control small-pox. You will find that the highest years for small-pox were also the years of the highest vaccination.

17,500. (Sir William Savory.) I should like to see how far you have gone into the Leicester small-pox data, with reference to the death-rates at different ages: shall you produce those tables?—I purpose producing them.

17,501. Do you know the decennial supplements to the 25th and 35th and 45th annual reports of the Registrar-General?—I may have seen them, but I cannot at this moment call them to mind.

17,502. Do you know that they serve to bring out the fact that, in Leicester, in the different decennial periods 1851-1860, 1861-1870, and 1871-1880, there is a progressive diminution in the share of the total small-pox mortality borne by children aged between one and five years; namely, 41·7 per cent. in the first period, 37·5 per cent. in the second, and in the third period only 17·5 per cent. Similarly, if you take the death-rate of small-pox per 10,000 at this age in Leicester in those periods, 1851-60, 1861-70, 1871-80, you get in the first a rate of 94; in the second a rate of 58;

and in the third a rate of 49; a small-pox death-rate between the ages of one and five years lower than ever before since the register began, and this notwithstanding the greatest abundance of small-pox on record?—May I ask whether the groups you are referring to are groups of 10 years?

17,503. Yes?—As I understood you had an objection to any figures except annual figures.

17,504. I cannot get any others; in this case there is such a striking diminution between the years of one and five which does not pertain to other years, and yet small-pox is most fatal at that period?—I have already met that statement this afternoon by a quotation from the 30th report of the Registrar-General showing that although there are a smaller number of children dying from small-pox at the younger ages—

17,505. Between one and five?—Yet the general mortality between those ages has increased.

17,506. From small-pox?—Not from small-pox; I say from other causes.

17,507. Surely that does not meet the case I am taking; the question is what influence has vaccination upon small-pox?—The crucial question I take it is whether the influence of vaccination has saved life from small-pox, and if concurrent with an assumed saving of life from small-pox at the younger ages we find an increased death-rate from other tabulated causes, then I am inclined to ask where is the possible saving of life from the influence of vaccination?

17,508. That is quite another question; do you admit that vaccination has an influence in saving life from small-pox, between the ages of one and five?—I do not.

17,509. Then how do you explain these tables?—I would rather defer any answer upon that subject until I deal with the Leicester tables upon the same question.

17,510. But how do you explain the fact?—I think it is quite possible, in fact I know from the statistics you have just read, and I have no reason to doubt that there is a saving of life from small-pox at those younger ages.

17,511. From vaccination?—No, I do not admit that.

17,512. From what?—In all probability I shall be able to produce some other figures which would run concurrently with yours, and which would entirely upset the line of argument you are now pursuing.

Adjourned till Wednesday next at 1 o'clock.

## Seventy-third Day.

Wednesday, 15th July 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITBREAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

1 July 1891.

17,513. (Chairman.) Will you now proceed with your statement?—In resuming my argument, I will now hand in Table 33. (The table was handed in. See Appendix III., Table 33; page 450.) This table gives the average annual deaths from all causes for consecutive life ages in quinquennial periods, with the population for the middle year of each period 1838-89. This table contains the annual deaths given in Table 31, only here they are given for five-year periods,

instead of in single years, and this also is an inclusive table for all the ages mentioned; namely, under 3 months, under 6 months, under 12 months, under 5 years, under 10 years, under 15 years, 15 years and upwards, and the total deaths for all ages. The next table, Table 34, which I will now hand in, gives the average annual death-rate from all causes per 1,000 total population for consecutive life ages in quinquennial periods, 1838-89, with the average annual



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per-centage of registered vaccinations to total births, 1849-89. Table 34 is similar to Table 32, but the figures are given in groups of five years, and I have here a diagram which will illustrate that. (*The table and diagram were handed in. See Appendix III., Table 34, page 450, and Diagram M., facing page 450.*)

17,514. Where do you get your materials from for the deaths under the particular ages?—The principal part of them are abstracted from the Leicester Medical Officer's reports.

17,515. And the rest?—The rest have been abstracted from the local death registers for the years previous to the issue of those reports. Referring again to the Diagram, as its heading points out, this diagram shows (1) the average annual death-rate per 1,000 total population, with the relative proportion of deaths at each enumerated age, in quinquennial periods 1838-89; (2) the average annual total death-rate inclusive, measuring from the base line of the diagram to the upper edge of each colour; (3) that the decline in the death-rate (due to sanitary improvements) is checked, and a considerable increase of the death-rate corresponds with the period of more rigorous enforcement of vaccination 1868-72; and (4) an emphatic decline in the general death-rate, and especially in the younger ages, as the practice of vaccination declines. The average annual death-rate is represented on this diagram by each column; the deep blue colour at the base of the column represents the deaths under 3 months; the lighter blue the deaths from 3 to 6 months, and the lightest shade of blue the deaths from 6 months to one year.

17,516. Are those totals in proportion to the population?—Yes. The totals for all ages, as well as those for each enumerated age; they are the death-rate per 1,000 of the population.

17,517-8. Those are the actual numbers, not the rates?—No. They are the average annual death-rates per 1,000 for each of those periods. The yellow colour on Diagram M. shows the proportionate number of deaths from one year to five years, and the red colour the number of deaths from 5 years to 10 years; the pink shade the proportion of the deaths from 10 to 15 years; and the slate colour represents the proportion of deaths above 15 years; so that the average annual total death-rates at all ages, as well as that under each of the ages enumerated, can be ascertained by measuring from the base line of the diagram to the top of each colour respectively.

17,519. (*Mr. Meadows White.*) What is the faint pink line and what is the strong pink line?—The solid red curve above the columns represents vaccinations, including public and private throughout. The space between the faint dotted red line and the vaccination curve represents the addition made for the private vaccinations, 1849-62.

17,520. (*Chairman.*) For the period 1883-87 it is calculated, I suppose, upon the same estimate of population as you have referred to before?—Just the same. The death-rate is calculated upon the Registrar-General's estimate of population since the census of 1881.

17,521. It is not corrected by the last census?—Not at all; we have made no corrections for the last census.

17,522. (*Mr. Picton.*) In which direction would correction cause an error?—It would cause rather an increase in the death-rate, because the population has been over estimated. I do not know to what extent, but I should think a little over one per 1,000 in our average annual death-rate for 1883-87. Resuming my statement I will point out that in the period when vaccination was highest, namely, 1868-72, the average annual deaths from all causes per 1,000 total population under 3 months, under 6 months, under 12 months, under 5 years, under 10 years, and under 15 years, each attained its maximum. The average annual percentage of vaccinations to total births at that time was 91·7. At the present time (1888-89) the average annual per-centage of vaccinations has fallen to only 5·1. The saving of life under 3 months is now 1·64 per 1,000; under 6 months the saving is about 2·7 per 1,000; under one year the saving is 3·4 per 1,000; under 5 years the saving is 6 per 1,000; under 10 years the saving is 6·47 per 1,000; and under 15 years the saving of life is 6·7 per 1,000 as compared with the highest vaccination period. Over 15 years the saving is 2·72 per 1,000.

17,523. (*Chairman.*) If one per 1,000 were added that would be one per 1,000 upon the total, would it not?—Yes.

17,524. You do not know how that would be distributed?—I do not know how the one per 1,000 would be distributed amongst the seven enumerated ages dealt with on Table 34; but I find that our saving of life at all ages is now 9·43 per 1,000, which represents a total saving of about 1,392 lives per annum on our present estimated population for the borough of Leicester.

17,525. You are taking now the two last years?—Yes, comparing the average annual death-rate for the two last years with that of the highest vaccination period.

17,526. I thought you rather agreed that the two years were hardly a fair comparison with the previous five years?—At the time these tables were prepared they were all I could get for the last period, but in the following year 1890 we find the death-rate precisely the same as that for the two previous years and even so far as we have gone into the present year (1891), unless the influenza epidemic has upset the calculation, the death-rate is still about the same, so that the average amounts to practically the same for three and a half years out of the five.

17,527. But the influenza epidemic will have increased it, will it not?—Even if it has there may have been a decrease from other causes.

17,528. But you know what the death-rate was for two or three months; it was abnormally high, was it not?—Yes, it was very high indeed; but now for the last two or three weeks it has been extremely low.

17,529. But take your ninth and tenth periods, that is to say, 1878-82 and 1883-87, your vaccination had fallen from 66·7 to 29·9. If you were to correct the period of 1883-87 according to the population, there would not be a very considerable diminution, would there; take under three months, for example?—No, because in the total death-rate at all ages the difference would not be more than one per 1,000.

17,530. Under three months it would be more than 2·89, because in estimating it for the population you have estimated it for a higher number than there were; the 3·43 comes down to 2·89, and the 2·89 must be increased somewhat. That very great reduction in vaccination would show only a very small reduction in the death-rate, would it not, both under three months and under six months, and under 12 months probably even?—Yes, but there would still be a great saving on the total.

17,531. Under one year at present the difference is, by your Table 34, only 7·86 as compared to 7·36; if 7·36 is too low you clearly cannot raise it without coming very near to your 7·86?—But I do not know whether it is fair to argue upon any alteration that might be made by a readjustment of the populations for the last decade, because the whole of the calculations I am making for Leicester will be compared with the statistics of other places, the populations of which have not been revised.

17,532. But I am not dealing with other places, but with Leicester itself. In the period of 1878-82, you were able to correct the figures by the census of 1881, except for the year 1882?—We could now correct the population for that year.

17,533. But it was corrected, was it not? What have you taken for your basis for the year 1881? Have you taken the real ascertained population or some imaginary population?—I have taken the same population as the Registrar-General has taken.

17,534. This is your census population?—Yes, with the addition of one quarter of the annual increase made to the census population to bring up the number to the middle of the year.

17,535. So that one may take it that up to 1881 you have a census population with an estimate which may slightly err, but from 1883-87 you have an estimate which you admit to be too high?—It is found to be too high by the recent census for 1891.

17,536. Therefore, if it were corrected, the 7·36 would appear to be something more than 7·36 of deaths under 12 months?—It possibly might; that would depend upon where the increased number of deaths fell; there might be some under three months.

17,537. It is extremely unlikely that there would be none under 12 months?—That is so.



- Mr. J. T. Biggs. 17,538. You take the actual number who die under one year to get the proportion, and then compare it with a supposed population, and that population you compare it to is higher than the real population; if you correct it to the real population, your figures must be slightly higher, must they not?—Yes, slightly so.
- 17,539. If the 7·36 were corrected it would not much differ from the 7·86, and it might even be higher, but it could not very much differ?—Not very much.
- 17,540. Yet you see in that period, although there is no substantial diminution in the proportion of deaths of children under 12 months, there is an immense drop from your 66·7 of vaccination to 29·9; does not that rather show that you cannot argue conclusively as you appear to have done from a comparison of any one decade, that the fall in the infant death-rate corresponds with a rise or fall in the vaccination rate: that the two are connected one with the other?—I do not know that there is any reason why we should not argue as I have done, because in the period to which you are alluding, the system of vaccination was rapidly altering from the method adopted in period seven and period eight more particularly, the children being vaccinated at a later age.
- 17,541. But I invite your attention to period ten as compared to period nine. If you are right that diminished vaccination is the cause of diminished infantile death, when you have such a fall as from 66·7, to 29·9 (which is the largest fall you have had down to that time), would you not expect a fall in the infantile death-rate?—Yes, that would seem to follow as reasonable; but I was about to point out to your Lordship that in this period nine, to which you directed my attention, the vaccinations were not carried out at so young an age as they were at periods seven and eight, so that in the periods seven and eight, 1868–77, vaccination would be much more likely to affect the mortality at the younger ages than it would in periods nine and ten, specially period ten, to which you are alluding.
- 17,542. What is your ground for saying that in period nine vaccinations were not carried out at such a youthful time of life as in period eight?—The law began to fail into abeyance, and vaccination was not enforced at so young an age in those years as compared with the previous periods when it was rigorously enforced at the legal age.
- 17,543. Could you give the proportions?—No, I have not an analysis of the vaccinations here, so that I could not possibly do that.
- 17,544. (Dr. Bristow.) I suppose that there have been very few vaccinations under three months?—Yes, recently; very few comparatively.
- 17,545. Having regard to the two periods which have just been discussed, how do you account for the diminution in the death-rate under three months in the second period as compared with the first; you do not refer that to vaccination, do you?—I should, some part of it decidedly.
- 17,546. I understood you to say that vaccinations did not take place in the three months?—In the answer I have just given to his Lordship I stated that the vaccinations were forced on at a much younger age in period seven than they were in the periods to which you now allude.
- 17,547. I asked you whether they were often done under three months?—They were not largely vaccinated under three months at any time, but there would have been a larger number at the time the penal Act of 1867 came into force than in subsequent years.
- 17,548. (Chairman.) Would there have been a number large enough to affect the death-rate of children under three months when compared to the total death-rate?—Yes, I think so.
- 17,549. (Dr. Bristow.) I was calling your attention to periods nine and ten. I understand you to say that in those periods vaccination was not performed so early as it was in the earlier periods. For these periods very few vaccinations could have occurred under the three months' age?—There would have been some, but not so many as in the previous periods.
- 17,550. Then I want to know how do you account for the diminished deaths of children under three months in the tenth period; you do not put that down to vaccination?—Some part of it I do.
- 17,551. You have no proof of that, have you?—We have as much, if not more, absolute proof of that, than we have of any saving of life by vaccination.
- 17,552. Vaccination is required to be performed after three months' by law, is it not?—Within three months, not after three months. At the expiration of three months if no certificate has been received that the child has been successfully vaccinated then the Vaccination Officer takes steps to secure its vaccination, but I could not give the Commission the proportion of certificates which are received under that age.
- 17,553. (Dr. Collins.) Is there much fall in the under three months' death-rate between periods IX. and X., if, as his Lordship suggests, you were to correct the latter period in regard to the deficiency of population which has been ascertained?—Not a very great fall.
- 17,554. It is insignificant, is it not?—Practically so.
- 17,555. (Professor Michael Foster.) Can you tell the Commission at all how much of the vaccination is carried on before the termination of the three months?—I could not give the proportion.
- 17,556. (Mr. Pictou.) The law requires vaccination to be carried out before the termination of the three months?—Yes, the law requires it to be carried out before the termination of three months. It is obvious that in distributing a fall over the death-rate of, say, two or three per 1,000 amongst the seven different ages, you cannot allot a very great fall to each one in particular. I think the falls in each instance are distinctly marked considering that we distribute them amongst the seven different ages.
- 17,557. (Mr. Meadows White.) Up to what age do you say vaccination affects the health, giving your best judgment from your experience?—I think it affects the health of the weakly much earlier than that of those who are strong, but I believe that a permanent effect does remain in many instances.
- 17,558. But the fall in the death-rate appears to me to apply much more strongly in the older ages, than in children?—There is a general decline in the older ages, irrespective of vaccination, in all the periods excepting one.
- 17,559. From 1872 the fall is much more rapid to 1889 than it is before, particularly in the last period?—Are you speaking of the all age death-rate or of the death-rate for ages over 15. The latter seems to be fairly regular?
- 17,560. But is not the diminution in the death-rate much greater than it is in the former periods?—No, I think not, because if you look at period one and period two there is a drop of nearly two per 1,000, and then in period three the drop is not more than 0·5 per 1,000.
- 17,561. What is the rate of diminution in the ages above 15, between the periods 1883–87 and 1888–89?—The fall there is 0·7 per 1,000.
- 17,562. What is the per-centage of diminution, say, from three to six months?—I give the rate per 1,000 both under three months and under six months.
- 17,563. Take it under six months?—The fall under six months is 0·39 per 1,000 for the last two periods.
- 17,564. So it is a very much larger diminution in the ages over 15 years than it is at the vaccination age?—I do not think so, when you consider the very much larger number of the population over which you have to distribute it.
- 17,565. But I thought it was a rate?—It is a rate per 1,000 on the total population, but still you have to consider the amount of population living at those ages.
- 17,566. (Chairman.) In order to arrive at an accurate conclusion ought you not rather to take the proportion of the deaths at this early age, under six months, to the births in the year rather than to the total population, because supposing you have one period with a lower birth-rate than another that change of itself would cause you to have a lower death-rate taken on the population, would it not, of children at the early age although the proportion of children dying might vary but little?—It would have that tendency. I propose handing in a diagram to illustrate the death-rate of infants per 1,000 births.
- 17,567. I find in the Medical Officer's report for 1889, page 50, if you take the period from 1870 to 1879, which will cover the whole of your highest vaccination, that the deaths under one year were 213 out of every 1,000 births, that being the annual average for the 10 years 1870–79?—They are much below that now.
- 17,568. In 1889 the rate was 209·6, which does not strike me as so very much below the average for the 10



years to which I referred, the average being 213, while the rate was 209 in 1839?—As I have already said, I propose later on to deal with that point fully in three or four tables and a diagram.

17,569. (*Dr. Collins.*) Am I right in saying, looking at this Diagram M., and Table 34 broadly, that taking the total death-rate at all ages the table indicates a continuous decline of the death-rate with the exception of certain quinquennia, namely, 1863-67, 1868-72, and 1873-77?—Yes, Table 34 shows a continuous decline in the death-rate with those exceptions; the total death-rate shows a rise from 1863-67, and, omitting the first two periods, 1838-47, it reaches its maximum in 1868-72, after which we have a continuous fall.

17,570. So that the period 1873-77 was almost on a par with the period 1858-62?—Yes, nearly so.

17,571. Now looking at the death-rate under one year of age, am I right in saying that in no period since 1838-42 is the low death-rate for that age reached again until you reach the period 1888-89?—Yes, all of the death-rates under one year, as shown in Table 34, are higher until we reach the last two periods, when vaccination was very little practised in the town.

(*Chairman.*) You see it is not certain that the estimated population, on which the rates given in this Table 34 for the periods 1883-87 and 1888-89 are based, is correct.

17,572. (*Dr. Collins.*) Am I right in saying that the quinquennia 1863-67, 1868-72, and 1873-77 are the only quinquennia, which indicate a death-rate under one year above the 8 per 1,000 line?—Yes, those are the only three.

17,573. And of those three the quinquennium of 1868-72 stands highest for the death-rate both under one year and under six months, and under three months, does it not?—Yes, and these are the ages most likely to be affected by the vigorous enforcement of vaccination at that time.

17,574. And also under five years, and under 15 years?—Yes.

17,575. You suggested to the Commission various causes in operation upon the general infantile mortality some of them continuous in effect and others varying in effect, could you suggest any one cause which would indicate a variation concomitant with the irregularity of the three quinquennials which I have mentioned, with the exception of the one which you have alleged, namely, vaccination?—I have thought out that subject very carefully, and I really cannot suggest any other cause than vaccination. Most of the other causes that were in force in the period 1868-72 are still in force, some of them I believe have even become somewhat intensified, but that particular cause, vaccination, has certainly diminished very largely.

17,576. (*Chairman.*) I wish to call your attention to this. Upon a comparison of your periods two and three with period four, 1843-47 and 1848-52 with 1853-7, you will find, will you not, that at each of the ages, under three months, under six months, and under 12 months, the death-rate was higher in periods two and three than in period four?—Slightly higher, but the differences are not so marked as in the later periods we are discussing.

17,577. In period four as compared with period three, in the vaccination rate you have got to 80·2 from 62·8, would you attribute the decrease of deaths in period four to the fact that there was more vaccination?—I attribute the saving of life at that time to the Acts of Parliament to which I have referred as introducing sanitary improvements into the town.

17,578. But if when you find in two successive periods when the vaccination goes up that the death-rate goes up, and you therefore infer that vaccination must be connected with the higher death-rate, why on the same statistical grounds would you not be equally led to the conclusion that when at the earlier period vaccination went up and the death-rate went down the same conditions would apply, except you have a preconceived opinion that vaccination is injurious to health. Do you there as in other cases point to the figures as establishing the position which you have taken up?—The application of such an argument can be applied with greater force to the claims put forward on behalf of vaccination. My position is that in the two periods to which you now refer me the differences are so much smaller than they are in the later periods when the effect of vaccination was more manifest.

17,579. I wish to call your attention to this. In the comparison of your periods five and six, 1858-62 and 1863-67, when you say the death-rate goes up as vaccination goes up, the vaccination has not gone up nearly so much as it had in the periods to which I have called your attention, periods three and four, when you find the death-rate going down; it mounts in the one case from 62·8 to 80·2 with a lower death-rate, and in the other it mounts from 65·9 to 76·9 with a higher death-rate; why should you connect the higher death-rate you have in the latter case with the increase in vaccination when you find a greater increase in the two preceding periods if you compare them, accompanied by a lower death-rate?—There must be some causes occurring in 1863-67, which made people somewhat more unhealthy in those years, because you find that the death-rate over 15 years which would probably be affected to a very small extent by vaccination rises from 11·09 to 11·32, which is part of the rise in the death-rate found in the all age column.

17,580. If you look again from periods seven to eight, taking the deaths under one year, there is not a very great difference between the latter period and the preceding period?—There is a difference of 0·94 per 1,000.

17,581. The vaccination rate had gone down from 91·7 to 80·0?—Yes.

17,582. Yet you find that although it has gone down from 91·7 to 80·0 there is no very great diminution in the death-rate at one year?—But we do find that there is a very considerable diminution or decline between period seven and period eight all through the different ages given in the table.

17,583. You do not find so large a decline between periods seven and eight as you find an increase between periods six and seven?—There is a larger decline I think. The increase in the total death-rate if you take the first period—

17,584. I am talking of children; if you take children under one year in period seven their death-rate is 9·94, and in period eight, 9·0, not a very large increase in the first period?—There is, apparently, only a slight difference there looking at the rates; but, taking this difference of 0·94 per 1,000 on our total population, even this small decline in the death-rate under one year would represent the saving of nearly 100 infantile lives per annum. At all the other ages there is also a great decline from period seven to period eight.

17,585. But that is a decline at the ages the least likely to be affected by vaccination?—The period under six months is the period most likely to be affected by vaccination, and here the decline is greatest. They decline at all ages, not excepting the one you mentioned, namely 12 months.

17,586. But under 12 months includes those under six months and under three months?—It does.

17,587. (*Dr. Collins.*) Your attention has been specially directed to the quinquennium 1853-57, in which there is an increased per-centage of vaccination to births, I suppose about that time the first Vaccination Act rendering vaccination compulsory came into operation, did it not?—It came into operation in 1853.

17,588. Will you tell me whether it was the experience of Leicester that the operation of that Act was to secure as early infantile vaccination as was subsequently secured by the later enactments of 1867 and 1871?—The Act of 1853 did not by any means secure such early vaccination as the subsequent Acts secured, because there was a large number of vaccinations in arrears which were cleared up specially in the years 1863 and 1864.

17,589. (*Chairman.*) But my calculation was for the preceding quinquennium; do you think there would be much difference between the preceding quinquennium and the quinquennium 1853-57?—I do not think there would be much difference.

17,590. (*Dr. Collins.*) Could you tell whether the increase of vaccination in 1853-57 was largely an increase of vaccinations at ages above that of infancy?—I cannot give definite information upon that point.

17,591. (*Mr. Picton.*) Do I rightly understand you that upon this table from 1838 to 1889, omitting the middle periods six, seven, and eight, there is a steady inclined plane of fall in the mortality?—There is; it is only arrested at those periods.

17,592. Those periods six, seven, and eight appear to be an arrest of the decline, and exceptional?—Yes.

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17,593. To what causes do you attribute the general fall in mortality from 1838 to 1889?—I should principally attribute the general fall to sanitary improvements.

17,594. You regard those exceptional columns six, seven, and eight as indicating some interfering cause which obviated the effect of sanitation?—Yes, I do. In fact, if you will look at Diagram M., and draw a straight line from the top of the first column (1838–42) to the top of the last column (1888–89), the line would fall obliquely across the diagram, and would show what should have been the progressive decreasing height of the columns under the natural influence of sanitation. Speaking generally, all the deaths shown by the upper part of the columns above that line represent the increased death-rate which may be fairly attributed to vaccination.

17,595. That cause you believe to have been the growth of vaccination at that period?—Yes, I do.

17,596. (*Professor Michael Foster.*) Do I understand you to say that you have carefully examined the question and that you find no other factors during those years but the increase of vaccination which would increase the mortality?—I have mentioned a number of circumstances to the Commission which probably might affect it, but none so largely as vaccination.

17,597. I thought in answer to Dr. Collins you said that you had examined and you were not aware of any other factor but that of vaccination which increased the mortality?—No, I did not say that.

17,598. But you are aware of other factors besides vaccination?—Yes, I have already mentioned them to the Commission.

17,599. (*Mr. Picton.*) As a matter of fact, during the exceptional quinquennia six, seven, and eight, the progress of sanitation was just as noticeable as previously?—Yes.

17,599a. (*Mr. Bright.*) In those three periods which have been mentioned, there were a considerable number of deaths from small-pox?—Yes, taken altogether, but from 1868 to 1872, our highest vaccination period, there was the greatest mortality from small-pox.

17,600. But was there an increase of general mortality?—There was; the general mortality was rather high; but concurrently with the small-pox epidemic there were some other zymotic epidemics in the same group of years.

17,601. But the mortality from small-pox for those three periods does not account for the increased general mortality, does it; that is to say, it does not raise these columns?—It only raises them slightly taking the rate per 1,000, but not to any appreciable extent as I showed in the comparison between the seven principal zymotics, and the six excluding small-pox.

17,602. (*Chairman.*) Scarlet fever, I think two years before the small-pox epidemic, was raging very severely and caused more deaths than small-pox, did it not?—The average annual mortality per million from scarlet fever for the five years 1863–67, which are the years I think your Lordship is alluding to—

17,603. No, I was speaking of the period 1868–72?—For the previous group of years the average annual death-rate for scarlet fever was 866 per million and for 1868–72 it was 855.

17,604. That was because there were two or three years in which there were hardly any deaths from scarlet fever, but there was a very heavy epidemic which came in two years, namely, 1870 and 1871, of the period 1868–72. You might have a low average although you had two very severe years of epidemic. I think you will find that that was so. I think they had more influence than small-pox?—For which years?

17,605. There were two years in that quinquennium, the years 1870 and 1871, in which there were 375 deaths from scarlet fever?—There were only 9 deaths from scarlet fever in 1868, 8 in 1869, 263 in 1870, 112 in 1871, and 5 in 1872.

17,606. So that there were two years out of that quinquennium in which there was a very heavy scarlet fever epidemic?—Yes, during the year 1870 there was the highest number of deaths we have ever experienced from that disease.

17,607. (*Mr. Meadows White.*) I think you said in answer to Dr. Collins that vaccination was at a higher age in 1853 than it was in 1867?—In 1868, soon after the Act of 1867 came into force, children were vaccinated at a younger age.

17,608. Was that so?—Unquestionably.

17,609. What was the age in the statute of 1853; was not it the same age? it was the same age in both cases, I think?—Yes, but in the former case there were no penalties to enforce it.

17,610. Were there no penalties in 1853?—Vaccination was then made obligatory, but I do not think any definite penalties were attached to its non-performance.

17,610a. (*Dr. Collins.*) Is it not more correct to say that there were no Vaccination Officers to bring the cases up?—Possibly so.

17,611. (*Mr. Meadows White.*) I think there was a penalty; the Registrar of Births and Deaths had to give notice that the directions of the Act should be obeyed?—But even if that were the case, having made particular inquiries as to whether any penalty was inflicted under the Act of 1853, I find that there was none; but immediately on the Act of 1867 coming into operation we had summonses in 1868 within a month or two of the Act coming into force.

17,612. (*Dr. Collins.*) I find, for instance, in the returns of the Local Government Board, page 479 of the 19th Annual Report, that the per-centage of vaccinations to children born, was in 1854 for all ages 108·7; greater than the actual number of births. That would indicate, would it not, that vaccinations were then going on of persons above the early infantile age at which vaccination usually takes place?—Yes, it would indicate that such was the case.

17,613. (*Chairman.*) But not necessarily in any particular place?—That is spread as I understand all over the country.

17,614. (*Dr. Collins.*) Was there any epidemic in the year 1854?—In Leicester do you mean?

17,615. Or England and Wales; was it a high year for small-pox do you remember?—I think the epidemic which was really the cause of the Act of 1853 being passed had just gone by. In 1852 we had an epidemic which ended in 1853, but in 1854 we had no small-pox deaths at all, nor any in 1855 in Leicester.

17,616. I find the total deaths from small-pox in England were only 2,808 in 1854?—There were in Leicester 52 deaths in 1852, but none in 1854. Continuing my evidence, I would point out that the next table which I will now put in gives in parallel columns the average annual deaths from all causes with the death-rate per 1,000 total population under and over the life ages mentioned in the table, in successive quinquennia, 1838–89, with the average annual per-centage of registered vaccinations to total births 1849–89. (*The table was handed in. See Appendix III., Table 35; page 451.*) This table enables us to make a comparison between the deaths and death-rates under and over one year, under and over 5 years, under and over 10 years, and of persons under and over 15 years of age. The figures giving the deaths under these respective ages are partly the same as those in Table 34. The maximum death-rate under each of the younger ages respectively given in this table is reached during the highest vaccination period, and the saving of life for non-vaccination times as compared with the period when vaccination was rigorously enforced is the same as in Table 34. Table 35 also gives the number of deaths, and the death-rates, for the ages over those given in Table 34. Before I proceed to the next division of my statistics I should like to refer to the present position of the carrying out of vaccination in Leicester. The last return given in by the Vaccination Officer shows that for the quarter ending June 1891 there were only 21 children successfully vaccinated, 1,131 notices were served, 180 personal inquiries were made into cases in arrear, and 85 B notices left with the parents. This is remarkable as being the lowest number of children that has ever been vaccinated in any quarter since the Vaccination Officer was appointed. The next division of my statistical tables has reference to the deaths and death-rates of infants under 12 months to every 1,000 births. This may be regarded as the first of the tables for the death-rates on proportional populations. Table 36, which I will now hand in, gives (1) the annual deaths and death-rate from all causes of infants under three months, three to six months, and six months to one year, with the totals under one year per 1,000 births; (2) the annual births and birth-rate per 1,000 total population, 1838–89; and (3) the per-centage of registered vaccinations to total births, 1849–89. (*The table was handed in. See Appendix III., Table 36, page 452.*)



I have prepared the figures for the births and birth-rates in this table annually, so as to make it as complete as possible for the purposes of analysis, comparison, and investigation. The high death-rates which set in with the year 1868, the first year of penal vaccination, are maintained throughout the quinquenniad to 1872. Table 37, which I will now put in, is Table 36, with the figures given in quinquennial periods. I have a diagram illustrating this table and Table 39, which I think I had better hand in now. (*The table and diagram were handed in. See Appendix III., Table 37, page 453, and Diagram N., facing page 453.*)

17,617. (*Chairman.*) I wish to call your attention to one or two points which strike me about Table 36; do you find a correspondence here between the amount of vaccination and the death-rate under 12 months per 1,000 births?—Yes; there is a correspondence. We find a very great rise in the mortality with the introduction of the penal Act.

17,618. I am not speaking of the penal Act; I am speaking of the rate of vaccination which is a different thing from the penal Act; the penal Act will not matter except to the extent that there is more vaccination than before?—That is the extent to which it would affect it.

17,619. But I am speaking now about the rate of vaccination; do you find a correspondence here between a higher vaccination rate and the death-rate under one year?—Yes, there is a correspondence from the year 1868, when we have the highest rate of vaccination and the highest death-rate ever attained for 30 years previously. We had also a very high rate of mortality, corresponding with a high vaccination rate throughout, especially in the first quinquennium after the introduction of penal vaccination.

17,620. I see that in 1872 you put the vaccination rate as 107·1, that is to say, more vaccinations than there were births?—Yes, because on the system of distribution I have adopted the vaccinations now include all 'deferred' vaccinations.

17,621. But this is taken on some different basis from your Diagram A. ?—It is on the basis I fully explained at the last sitting.

17,622. I must get exactly what the basis is, because this appears to be taken on a different basis from your Diagram A. ?—It was suggested to me on the last occasion that I should deal with the vaccinations on some consistent basis throughout and I have now done so. If you will kindly look at the vaccination column in the table I can explain it in a few words.

17,623. You explained on the last occasion the way of getting quinquennial periods, but you have not explained how you get your figure for, say, the year 1872; 107·1 as compared with the figure given on your Diagram A. ?—We now give the total number of actual vaccinations that were performed within the year.

17,624. Whenever done?—Yes.

17,625. That is to say, whatever the age of the child?—Yes, irrespective of age, so that now from beginning to end the basis of the vaccination curve is consistent.

17,626. I am not dealing with the curve because you have not shown us the curve of years; you are dealing with quinquennia?—I have already handed in several diagrams which show the curve for the annual vaccinations.

17,627. I have not seen any which show the annual curve upon the amended basis and we are talking of the annual figures. I want to know the basis upon which this Table 36 is made. Is the 107·1 arrived at for 1872 by taking the total number of births and the total number of vaccinations paid for in that year, or do you take private vaccinations also?—The per-centage (107·1) is based upon, and it includes the actual number of all the primary vaccinations, both public and private, performed within the year.

17,628. And for the year 1871 does the 81·1 include the same?—Yes, it is the same; all the years are on the same basis.

17,629. I thought you had not those accurately until 1872 and onwards?—No, we had not for the other basis, but I have been at the trouble to obtain them for this basis. The difference was that up to 1868 we were before including the vaccination of those whose vaccination had been deferred, and after 1868 we were including vaccinations of the annual births on the official method although they did not occur until some years

after, so that a proper comparison could scarcely be made between the early periods and the later. Now we have obtained them and so they are consistent throughout. I have not yet put in the annual vaccination table with all its details on which my vaccination curves are based, because it is one thing to sit here as a Commissioner and it is a very different thing to prepare the quantity of evidence that I have been requested to prepare, within so short a time. For the past five or six weeks I have been at work very hard indeed both night and day to get these tables ready in order to continue my evidence uninterruptedly, and it has been utterly impossible for me to prepare an annual vaccination table on the revised basis of distribution so as to present it to this meeting.

17,630. You do not find here in Table 36 that there is a correspondence, do you, between the vaccination rate and the death-rate under 12 months; for example, take the year 1868; in the year 1868, according to your table, the vaccination rate was 94·2 and the death-rate 256·68; the next year the vaccination rate was 94·7 and the death-rate 229·25, the vaccination rate being slightly higher but the death-rate considerably reduced; the next year the vaccination rate was 81·7, considerably reduced, and the death-rate was higher, 235·32; the next year the vaccination rate was a little lower, 81·1, and the death-rate again higher, 242·12; and the next year the vaccination rate was up to 107·1, the death-rate being considerably lower, down to 230·90; does that suggest to you any correspondence indicating cause and effect between the vaccination rate and the death-rate?—There is no exact correspondence, from year to year; I have never claimed that there was. Your Lordship loses sight of the fact that apart altogether from vaccination similar variations would be found in the annual death-rates. Therefore, even if the influence of vaccination were constant in its operation, these variations in the death-rates would still appear.

17,631. But in this quinquennium is there anything to indicate a correspondence from one year to another?—Yes, we have an enormous rise in vaccination in the year 1868 and we have a corresponding rise in the death-rate.

17,632. It is a comparison of 1868 and the subsequent years, with 1867 and the previous years?—What I maintain is that a much higher infantile death-rate sets in with the higher vaccination rate of 1868, and both these high rates are practically maintained concurrently for the ten years from 1868 to 1878.

17,633. In 1867 your death-rate under one year per 1,000 births is 226·41, and the vaccination rate is 43·2, whilst with a vaccination rate of 107·1 in 1872, the death-rate per 1,000 births is only 230·90. Would you not have expected where you found that enormous difference in the vaccination rate from a very low point to a very high point, if there were any connexion between cause and effect, to have found a very marked difference?—There is a difference, and it is a sufficiently marked increase in the death-rate to affect even the average annual five-year death-rate.

17,634. Looking at the figures alone, do they suggest to your mind that close correspondence which would indicate cause and effect?—Yes, they do, looking at them broadly.

17,635. I find in the years 1876 and 1877, which were years of a high vaccination rate, that is to say, 71·7 and 76·9, the death-rate under one year was 199·96 and 188·72?—Taken in five-year periods, and comparing 1868-72 with the last period, there is a decline in the vaccination rate, and there is a considerable decline in the death-rate.\*

17,636. But when we come to the years 1883-87, when there is a very much greater decline in the vaccination rate, are not the deaths very much higher than in those two years, 1876-77? In 1876-77 with the vaccination rate at 71 and 76, you have death-rates under one year of 199 and 188. Then take the period 1883-87 when the death-rates were 189, 233, 193, 216 and 215, with the vaccination rate in that quinquennium going down from 40 to 10; if there were that connexion between the vaccination rate and the death-rate, would you not have expected the comparison between 1873-77 and 1883-87 to have been very different from what it is?—There is a decline, but not a very marked one.

\* The variations referred to by Lord Herschell might, to some extent, be accounted for by the irregularity of the registration of the births and the deaths at the beginning or at the end of each year.—J. T. B.

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17,637. Is there any decline: the death-rate never reaches in the whole quinquennium of 1883-87 so low a point as it does in the year 1877, and in most years it is very much higher?—Yes, there is a decline for those two periods, both under 3 months, under 6 months, and under 12 months, although in the whole of the latter quinquennium, 1883-87, the death-rate was high; and one or two of those years were very bad, especially 1885, which was an exceedingly fatal year from zymotics other than small-pox (for which I gave the reason last week when this part of my evidence was rather anticipated). Yet, if you look at my Diagram N. you will see the difference; the decline is shown upon it. Although there is a rise in the period 1883-87, compared with the preceding period, the death-rate is lower than that for 1873-77, the period to which your Lordship alludes.

17,638. Is not the result this: that if you take the ten-year period from 1860 to 1869 the average annual death-rate was 213 out of every 1,000 births, and if you take the ten-year period from 1870 to 1879, the rate was precisely the same?—I have not calculated it out in that way; that is taking it in 10 year groups. I have not made any decennial calculations; indeed considerable exception has already been taken to the five-year calculations I have made.

17,639. But the period 1860-1869 would cover a period of a much lower amount of vaccination than 1870-1879, would it not?—Yes, on the whole I should think it would.

17,640. Yet the death-rate per 1,000 births is the same on the average for the latter 10 years as for the former?—May I ask if your figures are taken from our Medical Officer's reports?

17,641. That is on the Medical Officer of Health's report for 1888, pages 49 and 50, to which I previously referred?—It appears from that report to be 213 per 1,000 births, but the death-rate at the present time is an average annual of 206. It is well known that we have always suffered from a high infantile death-rate in Leicester.

17,642. Your figure 206 is for the years 1888 and 1889 alone, but if you take the last quinquennium you will not find it to be that; it would be for the last quinquennium, the years 1886 to 1890, 209 or 210, would it not?—I do not think it would be so high as 210, but from 1880-1889 our Medical Officer gives it as 210. The average annual death-rate per 1,000 births for the five years 1885-89 is about 207.

17,643. Have you got it for 1890, last year?—No, I have not, but I believe that the infantile mortality is given at page 55 of the report of our Medical Officer of Health for that year.

17,644. I do not quite understand this. You have down for 1888 a death-rate of 203·5, while the Medical Officer has 204·7; there is not much difference there, but for 1889 you have 200·41 and he has 209·6, which is a very large difference?—That is so.

17,645. I am told that in the year 1889, which I am speaking of, your figures in your Table 36 for the number of deaths under three months, three to six months and six to 12 months added together, give 44 short of the number which the Medical Officer gives for the deaths under 12 months, and that accounts for the difference?—That might account for the difference, I know there are several differences in his figures. I do not know how they would arise, but I know that for one of the years, 1885, there are two different figures given in the report of the Medical Officer, so that you cannot be positive as to which of his figures is right, but I took his judgment upon that.

17,646. Where did you get your figures, given in your Table 36, for the deaths under three months, from three to six months, and from six to twelve months of age in the year 1889?—I am not quite sure at this moment, I rather think they were given to me by the local registrar.

17,647. The Medical Officer of Health gives 1,004 as the number for 1889, if you add your three columns together you will find that they do not come to that, yours only come to 960, whereas he puts 1,004 as the total number for the year 1889. If that is correct it would make it quite inaccurate to say that the rate is now 202, for the last two years it would have been 206, would it not?—Yes, that would alter the rate.

17,648. It was 203 in 1890, I find?—I pointed out on the last occasion that in the artisan class there were a

larger number of women now working in factories as compared with former years, and I believe this affects the death-rate to a considerable extent. I will look up the question of the difference in the numbers.

17,649. (Mr. Bright.) I want to ask you before we leave Diagram N. if you have noticed a great difference in the vaccination rate between the quinquennium 1878-82 and that for the years 1888-89. I think it is a diminution from about 70 per cent. to about 5 per cent.?—Yes, it would be some such proportion as that.

17,650. Now I will ask you if you have noticed that during that time the deaths under 12 months of age have actually risen?—Yes, I have; they are rather higher in the last two years.\*

17,651. Does not that go very much against your theory that vaccination should cause the death of infants?—Not necessarily; I have just explained what I think is the cause of that.

17,652. The working in factories?—Yes, and the working in factories has increased of late years.

17,653. (Chairman.) But has it increased in the last two years as compared with the preceding five, do you think?—I think it has, because the tendency all round is to induce people to work in factories instead of working at home. In fact, in our staple industry, the shoe-trade, the workpeople themselves are agitating at the present time for this.

17,654. (Dr. Collins.) I think you told us that 1883 was the last year when there was any death from small-pox in Leicester?—Yes. We have had none at all since 1883.

17,655. So would any part of your death-rate in the last two periods be referable to the disease against which vaccination is employed as a preventive?—None at all.

17,656. (Chairman.) Does that conclude all you have to say with reference to Table 36?—It does.

17,657. Now we will take Table 37?—Table 37 is similar to Table 36, but the figures are given in quinquennial periods; it gives (1) the average annual deaths and death-rate, from all causes, of infants under 3 months, 3-6 months, and 6-12 months, and the total deaths and death-rates under 1 year per 1,000 births; (2) the births and birth-rate per 1,000 total population in successive quinquennia, 1838-89; and (3) the average annual per-centage of registered vaccinations to total births 1849-89. The death-rates in this table under three months for 1868-72, are the highest of any of the periods excepting 1848-52, which is 2·42 per 1,000 higher. The death-rate for those five years 1868-72 is 105·00 per 1,000 births, or about 10 per 1,000 above the periodic average for that age, the average rate being 95·13. The death-rate of children dying at the age of from three to six months, an age more likely to be injuriously affected by vaccination than the one previously referred to, shows by far the greatest mortality in the highest vaccination period, and it exceeds the periodic average by more than 17 per 1,000 births. From the age of six to 12 months for the same period the death-rate is the highest since 1838, being 6·4 per 1,000 above the periodic average; the total death-rate of children under one year for the same period exceeds the periodic average death-rate by no less than 34·5 per 1,000 births. The death-rates under each of these three ages are therefore considerably above the average death-rate and under two of the four heads they are the highest in the period of highest vaccination for the whole range of 52 years.

17,658. For which years?—The years 1868-72. The next table which I will hand in is similar to Table 36, but is inclusive throughout, that is the deaths under three months are included in the deaths under six months, and the deaths under both three months and six months are included under those for one year. (The table was handed in. See Appendix III., Table 38; page 454.) Table 38 gives (1) the annual deaths and the death-rate from all causes, of infants under the same ages as before, but is an inclusive table and an annual table. It also gives (2) the annual births and birth-rate per 1,000 total population for the 52 years 1838-89, and (3) the annual

\* But it must be remembered that this death-rate is related to the births, which is a much more erratic factor to base calculation upon than the population would be, and the incidence of the birth-rate has a most important bearing on this question. For instance, if the birth-rate, which is now rapidly declining, has diminished in a greater degree amongst the well-to-do classes, where the infantile death-rate is low, as compared with that of the lower classes, where the infantile death-rate is known to be high, it would have the effect of appearing to raise the death-rate of infants when calculated upon the births, even where there was no actual increase in the number of infantile deaths.—J. T. B.



per-centage of registered vaccinations to total births. Table 39, which I will now hand in, is similar to Table 38, but grouped into quinquennial periods. (*The table was handed in. See Appendix III., Table 39; page 455.*) This table gives (1) the average annual deaths, and death-rate, from all causes of infants under three months, under six months and under 1 year, per 1,000 births, (2) the average annual births and birth-rate per 1,000 total population in successive quinquennial periods 1838-89; and (3) the average annual per-centage of registered vaccinations to total births 1849-89. The death-rates during the fatal vaccination period 1868-72 are higher under all these ages with the exception of the rate for three months which is exceeded only in 1848-52. During 1868-72 the average annual death-rate of infants under three months was nearly 10 per 1,000 births above the periodic average, which would mean an extra loss of 38 lives for each year above the average, or a total loss of 192 infants under 3 months for this period. If the same death-rate prevailed now with our increased births we should be losing about 240 additional lives at this age during one quinquennium. These 240 lives, therefore, are being saved. The average annual death-rate during the highest vaccination period for children under six months is more than 27 per 1,000 births above the average periodic death-rate which means an additional annual loss of about 104 lives above the average annual, or about 520 for a period of five years.

17,659. Do you suggest that loss was due to vaccination and would have been saved if vaccination had been done away with?—I suggest that some part of it was undoubtedly due to vaccination.

17,660. Would it not be just as good reasoning upon this table, to say that if you compare 1883-87 with 1878-82 and you find that while vaccination has gone down from 66·7 to 29·9 the death-rate under one year has gone up from 197 to 209; therefore the cessation of vaccination has caused a loss to the extent of the difference between 197 and 209; that is to say, so many in every thousand lives during each of those five years? Why would that not be, upon the face of these tables, just as good an argument as the one you have just adduced?—I do not think it would for this reason: vaccination was introduced to prevent small-pox and we have had no small-pox to prevent; therefore there can be no saving attributed to vaccination.

17,661. But if you assume that because in the period with the less vaccination there are fewer deaths, there are those fewer deaths because there is less vaccination, if that is a good argument, why is it not an equally good argument if the same table shows in another quinquennium that a diminished vaccination concurred with an increased death-rate that the increased death-rate was due to the diminished vaccination? I am not saying that either is the right argument, but why is one better than the other?—But I do not know that the assumption is ever made that vaccination saves from anything except small-pox. It may predispose to death from other diseases, but it never has been supposed to save from those other diseases.

17,662. But you are assuming that it causes something, namely, death?—We know it does so in some cases. The Registrar-General's returns prove it.

17,663. Your argument is that vaccination did largely increase, in fact, mortality?—Yes, we believe that to have been the case in Leicester.

17,664. We are not now dealing with your belief, but with your tables and what they prove. I understand you to say that because you find, comparing one quinquennium with another, that a lower vaccination rate corresponds with a lower death-rate, that affords evidence that a higher vaccination rate tends to a higher death-rate; upon that I ask, supposing you find on another portion of the table the opposite result, that it has no influence in causing death, whether your inference is not a hasty one?—If you were to refer to particular periods of years it might point in that direction, but if the same argument were applied to small-pox and the supposed effect vaccination has had upon small-pox mortality we should have to come to the same result as your Lordship is now arguing.

17,665. Does not that show that in all these cases one cannot look at only one fact as being a cause of disease, but must take a great many things into consideration before one can form an opinion upon them?—Yes, I agree with your Lordship. But I certainly cannot be accused of bringing only one fact before the Commission

because I bring in a multitude of facts and figures so that the Commission can judge of the validity of what I allege.\*

17,666. You seemed to assume that the figures show that so many lives had been saved by giving up vaccination, that was the argument you were using; that because it had reduced the death-rate from so many to so many, so many lives had been saved: what I was pointing out was that it is at least doubtful whether you can show that they have been saved by vaccination or doing without vaccination without a much larger scope of inquiry than is now before the Commission?—But I do not limit the scope of the inquiry before the Commission, I only produce these figures that their general proportions may be compared with our vaccinations.

17,667. But that is sufficient to satisfy your mind?—No, not alone, I have connected it with other influences.

17,668. (*Sir Charles Dalrymple.*) What are they?—I have referred to them over and over again, sanitation for instance.

17,669. (*Mr. Picton.*) I understood you to say that you regarded vaccination as one amongst a number of causes, and that you did not pretend to judge of it, except by taking considerable periods?—Considering my statistics are practically confined to a single town, I have taken a very wide survey of the whole question, during a period of more than 50 years; and I have dealt with it under a number of aspects. Besides dealing with small-pox, and the seven principal zymotic diseases, in a variety of forms, I have related our general deaths to the birth-rate, to the vaccinations, to the total population, and to the proportionate populations at different ages.

17,670. (*Sir James Paget.*) I wish to ask you whether you have made a comparison between Leicester and other towns which are generally like Leicester in their arrangements, but quite unlike in the fact that they continue to vaccinate?—I have made the comparisons mentioned at former sittings of the Commission.

17,671. But in two of those cases, if I remember rightly, where vaccination is continued the mortality has fallen lower than that of Leicester?—Yes, but one, was Keighley, a great anti-vaccination centre, and the other, although it was slightly less, even in that the rate of decline was not so rapid as the decline of the death-rate at Leicester.

17,672. And in two it had fallen not so much?—Yes, or rather in four. And our zymotic mortality was relatively lower even than that of five towns out of the six compared with Leicester.

17,673. There is a large field over which it could be tested if vaccination causes an increased number of deaths?—Yes, and I think I have covered a considerable portion of that field in the comparisons already made, with fairly representative towns, and also with the country generally. As to other causes influencing the death-rate, I have not made any formal test which would enable you to tell what the exact effect of those causes might be, but I lay my inquiry into the statistics of Leicester before the Commission, and I presume they will be able to make a fair comparison.

17,674. But your tables are all drawn so as to show that the highest mortality coincides with the highest vaccination?—They have not been prepared with that object in view, they are drawn to show the actual facts which have occurred in Leicester, and the remarkable and suggestive coincidence you have mentioned is found in all of them. We take the line between the years 1867 and 1868 as the dividing point for the whole of the tables and diagrams.

17,675. Taking Diagram N. it appears that the mortality under 12 months in the period 1883-87 is just equal to that in 1848-52?—Yes.

17,676. In one case vaccination was at a high rate, and in the next at a very low one?—Yes, at a lower one.

17,677. Again, in 1853-57 the mortality was very much the same as in 1878-82, though in the former period vaccination was very high and in the latter period much lower?—Yes.

\* It should be borne in mind that the death-rate here under discussion is based only upon the births, not the population; and, therefore, as I have shown before, other considerations should come into operation in estimating the value of the figures in my table.—J. T. B.

Mr.  
J. T. Biggs.

15 July 1891.



Mr.  
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17,678. Does this table in fact show anything but that it so happened that in 1868-72 vaccination was very high and the mortality very high?—It shows that, undoubtedly.

17,679. But on other points it shows the very reverse of it?—That may be so, but I have not constructed these diagrams and tables to show my particular view. I have prepared them to show actual facts, and I give to the Commission not only tables and diagrams, but, to the best of my knowledge and judgment, the whole of the circumstances which may affect the death-rate.

17,680. (*Chairman.*) But you were drawing a comparison and saying that so many lives have been saved, which implied that something had been at work, which has ceased to be at work, because you do not save life although you may have a lower mortality. To say that so many lives have been saved, which was your expression, implies that that was due to some cause which you knew of which has ceased?—Yes, it does imply that, but even in that sense I think I am exceedingly modest in what I claim as compared with what is claimed by many of those who believe in vaccination. Dr. Buchanan, for example, claims that 12,000 lives were saved in 1881 through vaccination. He makes that statement emphatically, whereas I say he has no ground whatever for claiming that such was the case.\*

17,681. One very bad argument adduced from statistics will not make another bad argument a good one, we shall have to weigh all the arguments from the statistics and all the objections that may bear upon them. Does that conclude all you have to say upon Table 39?—I have still some observations to make as to the death-rate under one year as related to the births. The average death-rate for the 11 periods is 204·48 per 1,000 births. This rate is exceeded in the fatal vaccination period by no less than 34·42 per 1,000 births, which means an excess over the average number of deaths of about 133 annually. Had this infantile death-rate prevailed during the years 1888-89, our loss of infant life under 12 months old, would for each of those years have been about 166 more than those which actually died. It appears to me that these figures really do tell all in the same direction, especially when we consider the other circumstances I have named, and it would require a good deal of logic of the most convincing kind to persuade ordinary people that vaccination when rigorously enforced had nothing whatever to do with this high rate of infant mortality.

17,682. (*Dr. Collins.*) May I ask if the red curve in Diagram N., illustrating Table 39, represents the average annual vaccinations per cent. of births based upon the number of vaccinations in any given year of the children whenever born?—Yes, it does all the way through, the whole of the curve is calculated upon that basis of distribution.

17,683. Can you tell me from your own knowledge of Leicester whether the period 1868-72 subsequent to the Act of 1867 was a period of enforcement of early vaccination as well as of the enforcement of general vaccination?—It was a period of enforcement of vaccination at an earlier age than at any other period.

17,684. I think you appointed your Vaccination Officer in 1867?—No, our Vaccination Officer was appointed in 1868.

17,685. Was the effect of the appointment of the Vaccination Officer to make the average age of infantile vaccination earlier or very much younger than it had been in the previous periods with which you have been dealing?—Yes, its effect was to make the average age at which infantile vaccination was performed very much younger than it had been.

17,686. Then may I ask has the progressive abandonment of vaccination by Leicester been accompanied by a tendency to increase the average age at which infantile vaccination has taken place?—Yes, the neglect of vaccination has had a tendency to increase the age at which children are vaccinated.

17,687. Would it be correct to say that during the period of 1868-1872 infantile vaccination was more pressed and encouraged in Leicester than at any other period with which your statistics deal?—Yes, it was unquestionably.

17,688. Does it happen that the period 1868-72 shows the average highest infantile mortality under one year and under six months, higher than any other period of your statistics?—It does, undoubtedly.

17,689. With the single exception of the quinquennium 1848-52, does that same quinquennium show the highest mortality under three months?—Yes, it does, in fact that period was more fatal to infantile life than any other period known in Leicester for over half a century.

17,690. (*Chairman.*) When one looks at the table, one does not find a correspondence between the deaths under three months and the vaccination rate, because you find in the quinquennium 1878-82 for example, with the vaccination rate at 66·7, that the death-rate under three months per 1,000 births is 85·89; and in the quinquennium 1858-62, with the vaccination rate practically the same (65·9 as against 66·7), you find the deaths under three months 98·04, which is of course very much higher?—But I have told the Commission again and again that I do not regard the correspondencies as working with mathematical precision exactly, but they have a general tendency in one direction. The removal of one cause only out of a number of causes surely could not be expected to affect the death-rate to the same extent as the tabulated amount of the cause itself. For instance, let us suppose there are ten causes equally operating to produce one hundred deaths. The removal of one of these causes would not obliterate the total deaths, but only its per-centage share of them. And so with respect to vaccination, as it has declined our death-rate has proportionately declined.

17,691. The great fall, according to your Table 39, was from the quinquennium 1868-72 to 1873-77; there has been a greater fall there than in any other quinquennium?—Yes, the great fall is from 1868-72 to 1873-77.

17,692. There had not been a very great diminution of vaccination; it had gone down from 91 to 80?—Yes, it had gone down over 11 per cent.

17,693. But that is not anything like the subsequent diminutions?—No, it is not like the subsequent diminutions, but it is obvious that the removal of one cause out of many could not affect the death-rate more than to the extent of the influence of that cause itself as related to the influence of other causes.

17,694. But does not that tend to show that there was something else than vaccination operating, if you compare your seventh and eighth periods?—There might have been.

17,695. (*Dr. Collins.*) Would the period of 1873-77 be the period subsequent to the epidemic, when vaccination began to be abandoned?—Yes, it was immediately after the epidemic, when small-pox had stopped.

17,696. But would your statement as to the age at which vaccination was performed beginning to rise with the abandonment of the law, apply to the period 1873-77?—That was so, undoubtedly. The most rigorous enforcement of the law was from 1868 to 1872, and although later on an attempt was made to enforce vaccination it caused a large number of prosecutions so that as a matter of fact, people had refrained from vaccination, and those children which were vaccinated were therefore vaccinated at a much higher age.

17,697. Was the effect of the rigorous enforcement to lower the age of vaccination?—Yes, it was, during the period 1868-72.

17,698. (*Chairman.*) If during 1873-77 vaccination was at a later age, would you expect to find that that affected the comparison with the deaths under six months; the fall in the deaths under six months is more marked in this quinquennium than the fall in the deaths under three months as compared with any subsequent period?—Yes; that would follow, because as the time went on many children were not vaccinated until they were 12 months old.

17,699. Vaccination does not affect them until after they have been vaccinated, I suppose?—No, but it would be likely to affect them later in life in the second period more than in the earlier one.

17,700. Therefore, if vaccination was operating and there were 80 per cent. vaccinated compared with 91 per cent. in the previous period, you would not expect the deaths under six months to show a very favourable comparison in the eighth period with the seventh period?—Only that children vaccinated under three months would probably die in the period from 3 to 6 months.

\* Because, although fewer children may have died from small-pox, it is well known that they have died in increasing numbers from other inoculable disease. (See the return to the House of Commons, moved for by Mr. Hopwood, 13th August 1880.)—J. T. B.



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and therefore their deaths would be registered under six months, and those vaccinated under the six months' period would be more likely to live; they would be stronger and more vigorous and would resist its evil effects rather longer, so that when they died they would be registered under the age of 12 months.

17,701. It is true of children under one year, is it not, that there is a more marked diminution, comparing your seventh and eighth periods, than comparing any of the subsequent periods?—Yes. There is a more marked diminution throughout.

17,702. Does not that tend to show that there is some cause operating besides vaccination, seeing that there is not so much diminution in vaccination?—Yes, no doubt it would if there were but little diminution of the vaccination under that particular age. We find that one period is more fatal than another even apart from the considerations of the mischievous influence of vaccination.

17,703. (*Mr. Meadows White.*) If you take the last three quinquennial periods looking at Diagram N. and note the immense drop in the red line, and compare the parallelism with the other four columns, how does that at all consist with your theory?—I have already explained that.

17,704. Would you kindly repeat your explanation?—I have never stated that there is an absolute parallelism in the two; in fact there could not possibly be such parallelism between two dissimilar factors differing to the amount say of 10 per cent; for the removal of only one cause that was operating on the death-rate could not possibly diminish it to the extent of 50 per cent., but to only the extent of its former share of influence, that is to 10 per cent., because it is only one of the many causes contributing to the total death-rate.

17,705. I do not expect a parallelism, but I do not see any relation if this is intended to convey your meaning to the eye; there is a considerable fall from the highest period and under your theory concurrently with the drop in the red line, one would expect to find something like a corresponding fall in the black?—In the last four columns there is not a very marked decline, in such deaths calculated on the birth-rate; and one amongst other reasons I gave for that was the fact that a great number of the artisan class now work in factories who did not work in them at the earlier periods.

17,706. (*Dr. Bristowe.*) If you were to expunge the quinquennium 1868-72, would there be anything at all in Diagram N. to indicate that vaccination had any effect upon the death-rate upon young children?—Yes, I think you will find there is a marked increase in the period 1848-52; that column is much higher than the two previous columns. Of course if we expunge the main feature of a diagram it would indicate a different result, and one entirely at variance with facts. The next division of my statistics is that which relates to deaths and the death-rates for proportional populations. I will now hand in Table 40, which gives the approximate proportions of the annual populations of Leicester under and over different consecutive life ages from 1838 to 1889, namely, from 0-5 years of age, over 5 years, from 5-10, from 0-10, from 10 years and upwards, 10-15 years, from 0-15 years, from 15 years and upwards, and the total population at all ages. (*The table was handed in. See Appendix III., Table 40; page 456.*) The approximate proportions of the populations in this table are calculated upon the approximate rate per 1,000 for urban districts, under different life ages as given by the Registrar-General in Volume IV., General Report, Census of England and Wales, 1881.

17,707. (*Chairman.*) Is that a general rate that he gives?—Yes. He gives a rate relating only to the urban populations.

17,708. I do not know whether it would make any difference, but in a town with an exceptionally high infant mortality that would cause some disturbance of the figures, would it not?—There might be some slight disturbance, but I do not know what principle we could apply other than the one he has supplied which enables us to adapt the figures to our five year periods for the populations. There may be this difference in the application, that whatever rates we have found supplied by the census, we have applied to the five years preceding each of the census years as well as to the succeeding five years, instead of to the whole of the decennium preceding each census. I thought this would be fairer than allowing the same rates to apply to the whole of a decennial period. My

next table gives the average annual proportions in Leicester of population living at the different life ages given in the table, namely, 0-5 years, 5-10 years, 10-15 years, 0-15 years, 15 years and upwards, and the total populations for the middle of each period. The table also gives the total number of deaths from all causes at each such age, in consecutive quinquennial periods, 1838-89. (*The table was handed in. See Appendix III., Table 41; page 457.*) These populations are calculated to the same basis as those of Table 40.

17,709. Where do you get your deaths under five, between 5 and 10, and between 10 and 15?—They are from the same source as the figures taken under the total population death-rate.

17,710. From the Medical Officer's returns?—Yes, and the registers of deaths. Table 42, which I will now hand in gives the average annual number of deaths from all causes at the different life ages given, in the table, like those in Table 41; also the death-rate per 1,000 population living at each such age for the 52 years, 1838-89, in quinquennial periods, with the average annual per-centage of registered vaccinations to total births 1849-89. (*The table was handed in. See Appendix III., Table 42; page 458.*)

17,711. What do you mean by "proportion of population"?—The number of persons living in Leicester under different life ages. We have set out the proportion of population living under each of those ages.

17,712. It is not a proportion, it is the population living at those ages?—Yes, but it is a proportion of our total population.

17,713. It is not a proportion taken as between that and anything else; it is an actual estimate of the numbers?—It is an actual estimate of the total population proportioned between the different life ages. The numbers in the last column of the table give our total populations for the middle year of each period, and the other columns give them distributed according to the different ages. Looking at Table 42, we find the death-rate under five years for the period 1868-72 exceeds the next highest period, 1863-67, by more than 8 per 1,000, which means that during those five years about 518 lives were lost under five years of age more than in any other period shown by this table. The same period, 1868-72, gives an extra death-rate of nearly 17 per 1,000 children living under 5 years of age above its periodic average, or a loss during the five years named of about 1,004 young lives in excess of the average periodic loss from all causes. Comparing the average annual death-rate from all causes of children under 5, for the period 1868-72, when vaccination was 91.7 per cent., to the births, with the death-rate which prevailed in 1888-89, when vaccination was only 5.1 per cent., we find that the former death-rate exceeded the latter by nearly 44 per 1,000. If the same death-rate had prevailed, this would mean an annual loss at that age, under five years, of about 892 lives on our population for 1888-89, or, if spread over five years, a loss of about 4,460 lives. Vaccination being abandoned, these lives are now being saved.

17,714. How does this carry you beyond your previous tables; what is the purpose of this?—The tables I previously dealt with relate only to deaths taken on the birth-rate, whereas this Table 42 is based on the proportion of population at different life ages.

17,715. Which would be, I suppose, a somewhat inferior mode of comparison, and less likely to be accurate?—No; just the contrary, it is considered officially to be a superior mode of comparison; and it is the mode of comparison usually adopted now.

17,716. You know the number of births in the town, but you do not know the number of population under a particular age; you are taking it upon an estimate arrived at upon the average for the whole country; but that may be very much disturbed if in any particular place you have a specially large infantile mortality?—It might be disturbed\*; but may I point out that at the basis of all vital statistics lies the number of population, and this is a far more stable basis than a varying birth-rate. For nine years out of ten the Registrar-General himself is bound to take an estimate, he cannot know the exact number, and even for the tenth year a quarter of the population is also taken upon an estimate, so that our estimated populations for Leicester are no more hypothetical than those of the Registrar-General.

\* Our extra birth-rate at Leicester at least compensates for the large infantile mortality.—J. T. B.



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17,717. (*Dr. Collins.*) Does this table deal with ages over one year?—Yes, from 0 to 5 years of age, from 5 to 10, and other important life ages in various groups. The other table was limited to the death-rate under one year calculated upon the births.

17,718. Am I right in saying that the Registrar-General habitually restricts himself for the mode of calculating deaths upon births only to the infantile rate under one year?—Yes.

17,719. (*Chairman.*) But then you have the total for all ages in the previous table?—Yes.

17,720. Except as regards infantile mortality, is there any point for our consideration as connected with these other epochs into which you have divided it?—Yes, I think so, particularly under the ages of five years, and from five to ten. I was about to observe that these are the ages under which it is especially claimed that vaccination saves life. But when our vaccination rate was highest, instead of a saving we find an appalling loss of young lives, and, whatever other causes might have been in operation, I do not think that any man would be bold enough to venture to assert that the rigorous enforcement of vaccination had nothing to do with this fearful mortality. The death-rate from all causes during 1868–72 per 1,000 children living at the age of from 5 to 10 years exceeds its periodic average death-rate by 0·45, and it exceeds the death-rate which prevails in 1888–89 by 4·13 per 1,000, which would equal about 420 deaths in five years.

17,721. Now taking from 5 years to 10 years there is a large drop, comparing the period 1868–72 with 1873–77, from 7·11 to 5·17, that is a very considerable diminution?—Yes, there is a fall generally at that age from the period 1838–42.

17,722. But I am comparing 1868–72 to 1873–77?—Yes, there is a drop there.

17,723. There is a diminution of the vaccination rate from 91·7 per cent. of births to 80·0 per cent. of births; but it would be very unlikely, would it not, that more than a very few individuals less would be vaccinated between the ages of 5 and 10, or anywhere near that age, in 1873–77 than in 1868–72?—Very few no doubt; but we have later on to compare this death-rate with the death-rate from small-pox.

17,724. But would it not rather indicate that you had put too much stress upon the comparison between the various ages?—The diminution in the number of vaccinations actually performed would not be very great, because I do not suppose there would be many vaccinated at that particular age, but if vaccination as a protection from small-pox is in force up to 10 years, and if the effect of vaccination be, as I believe it is, detrimental, its mischievous influence would remain in force for the same length of time, and you will find that from the period to which you refer, 1868–72, the fall in the death-rate under this age continues very constant right down to 1888–89.

17,725. There is a slight increase at that age in the next quinquennium when vaccination had fallen, according to your table more than before, namely from 80·0 to 66·7 as compared with 91·7 to 80·0. The death-rates given in your table for the ages 5–10 years are, for the three quinquennia 1868–72, 1873–77 and 1878–82, 7·11, 5·17 and 5·24; while the vaccination rates are 91·7, 80·0 and 66·7?—It remains practically stationary for about 20 years, then after the period you have mentioned there is a considerable fall.

17,726. For the period 1873–77 the deaths between the age of 10 and 15 years go up from 4·21 to 5·28, and in the next quinquennium they go down to 2·52, which is the most remarkable drop which you have called attention to yet?—The tendency of that is to show that the further you get from the vaccination period the less the children are affected.

17,727. I do not quite see how it shows that?—The death-rate from 10 to 15 years, beginning from 1853–57 is pretty regular for a period of 25 years, and then a larger per-centage diminution sets in than perhaps in any other of the ages we are dealing with. The death-rate of children from 10 to 15 years of age per 1,000 living at that age was, for 1868–72, slightly below the average, showing the further from the vaccination age the better; but even this death-rate although below the average exceeded that for 1888–89 by 2·49 per 1,000.

17,728. And there again upon this table the period 1883–89 would not be accurate, by reason of the over

estimate of population?—It will not make serious difference in this calculation, because any adjustment of population would affect all the columns alike.

17,729. It would not be inaccurate as comparing the columns in the same quinquennium, but it would be inaccurate as comparing with a previous quinquennium?—The increase would be regular throughout. I was about to remark that grouping all these ages together under 15 years we have the highest death-rate concurrent with the highest vaccination period. The death-rate for 1868–72 was no less than 44·53 per 1,000 living under 15 years, exceeding the next highest death-rate by more than 3 per 1,000. It also exceeded the average periodic death-rate for the 11 periods on the table (Table 42) by 6·76 per 1,000, and it exceeded the average annual death-rate for 1888–89 by over 19 per 1,000. The loss of life under 15 years of age for the five years during the highest vaccination period would be 509 above that of the next highest period, 1,117 above that of the periodic average death-rate taken for 5 years and the enormous number of 3,167 more than the rate of 1888–89. The next table, which I will now hand in, enables a comparison to be made between the deaths under and over five years of age, under and over 10 years, and under and over 15 years. (*The table was handed in. See Appendix III., Table 43; page 459.*) This table gives the average annual proportions of population living under and over the life ages there given, with the total number of deaths from all causes at such ages, in consecutive quinquennial periods 1838–89. The populations are calculated on the same basis as Tables 40 and 41. Table 44, which I will now hand in, gives the rates for Table 43, with the addition of the average annual percentage of vaccination to total births. (*The table was handed in. See Appendix III., Table 44; page 460.*) I have prepared a diagram from this table, which I will put in next week. (*See Question 17,748.*) The only age variation which we have not hitherto dealt with in this group of tables is that which gives the average annual deaths and death-rate per 1,000 under 10 years of age. As in regard to the other ages already dealt with so under this age the highest death-rate occurs during our highest vaccination period and the lowest death-rate coincides with our lowest vaccination rate. The highest death-rate exceeds the death-rate of the next highest period by 4·5 per 1,000, exceeding the average periodic death-rate by nearly 10 per 1,000, and exceeding the death-rate for 1888–89 by nearly 26 per 1,000. These respective rates would mean for the quinquennium 1868–72 a loss of 527 lives more than for any other group of five years during the 52 years under review, a loss of 1,112 lives above the periodic average for the same length of time, and a loss of about 3,048 lives for the five years if compared with the death-rate which prevailed in 1888–89, when vaccination was practically abandoned. If the death-rate of 1868–72 now prevailed under this life age (10 years) we should be losing, on the population for that age, in 5 years, 4,970 additional lives, or about 1,000 lives per annum. These lives are therefore being saved, and no part of the saving can be attributed to vaccination. We now come to the division of statistics relating to Leicester which deals with the age incidence of small-pox and other zymotic diseases. The table which I will now hand in, gives (1) the total small-pox deaths, with the average annual death-rate from small-pox per million living at the different life ages given in the table, namely, 0–5 years, 5–10 years, 10–15 years, 15 years and upwards, and at all ages; (2) the relative per-centage of the death-rates per million in quinquennial periods 1838–89; and (3) the average annual per-centage of registered vaccinations to total births 1849–89. (*The table was handed in. See Appendix III., Table 45; page 461.*) These rates are also based upon the proportional populations given in Tables 40 and 41. I might first explain that the first line of figures for each group of years gives the absolute number of deaths under the specified ages, the second line of figures gives the average annual small-pox death-rate per million living at such ages, and the third line of figures gives the relative per-centage of the per million rates to each other. Taking the per million rates we find the three first periods from 0 to 5 years are very high. From the third to the fourth period there is a sudden fall from 3,175 per million to 454 per million, when a rise sets in which continues through four quinquennia, notwithstanding increasing vaccination, the rise being from 454 per million in the fourth period 1853–57 to 811 per million in the fifth period, to 1,468 per million in the sixth period, and then a further rise to 1,870 per million in the seventh or highest period of vaccination, 1868–



72. After the epidemic of 1872 there is a sudden fall to 56 per million for the eighth period, and with further declining vaccination the fall is to 24 for the ninth period, to 11 per million for the tenth period; and 0·0 for the last. At the next life age from 5 to 10 years we have a great rise in the per million death-rate of small-pox from the first period to the second, then a fall in the third period to about the same level as the first, being a difference of only 10 per million, but as in the age from 0 to 5 years, so also in that from 5 to 10, we then have an increase in the small-pox death-rate rising from 55 per million in 1853-57, to 182 in the next quinquennium, to 401 in the next period, period six, and a rise to the maximum small-pox death-rate per million under this age of 1,385 in the seventh or highest vaccination period 1868-72.

17,730. Do you think that per-centages taken upon such very small numbers are worth anything as a matter of comparison in the periods you are now speaking of. When you have only one death and two deaths to count so many per million is hardly worth anything, is it?—Of what period are you speaking, may I ask?

17,731. 1873-77?—We are bound to deal with such figures as we have.

17,732. I was suggesting that it was not possible to get any reliable deduction from a comparison of percentages when some of them are based upon very small numbers?—I do not think it is a very reliable deduction taken alone; yet on the other hand we are frequently asked to accept similar deductions when they appear to tell in favour of vaccination. But at the same time the per million rate being usually applied to small-pox calculations it is the only method that we can adopt for purposes of comparison with other figures. When we deal with the period 1868-72, our highest period of vaccination, the number of small-pox deaths is considerable.

17,733. In the period 1838-42, for example, there are only 16 between 5 and 10 years, and one between 10 and 15. In the period 1853-57 there are only two and one at those ages. Those are very small numbers to take out a proportion per million upon?—They are small numbers in some of the age divisions, but they are the only figures we had, and therefore we were reduced to the necessity of dealing with them in that way. Even if any gain could be claimed by believers in vaccination for the ages of 0-5 years, although my tables show it would not, it would at least be counter-balanced by the increased loss of life from 5 to 10 years. From 10 to 15 years there is also an increase from the 4th period to the 7th, rising in the 20 years from an average annual small-pox death-rate of 30 per million to 250 per million in the highest vaccination period, 1868-72.

17,734. Where do you get the figures for the deaths from—from the Medical Officer's report?—For the most part.

17,735. And where the rest?—The rest have been taken from the death registers. The figures are published in the Medical Officer's reports I think only from 1853.

17,736. But since his reports have been published you have got your figures from those reports?—Yes, I got them from that source with this addition—we have since 1872, included the whole of the small-pox deaths which have occurred in the hospital outside the town: so that these figures although they would correspond with those of our Medical Officer's figures would not correspond exactly with the figures of the Registrar-General's. For the ages of 15 years and upwards the small-pox death-rate per million for the first two periods is about the same, being respectively 56 and 57 per million; it then falls to 46 per million for the third quinquennium, and further declines to 34 per million for the fourth period, afterwards rising to 64 per million in the following quinquennium, 1858-62, and to 94 in the next, and 515 per million in 1868-72; the rates for the next four periods falling respectively 12, 10, 2, and 0 per million. We have therefore a rise in the small-pox death-rates per million under all these ages in the four complete quinquennia which follow the completer administration of vaccination, 1849-52. I should like to call the attention of the Commission to one feature brought out in this Table 45. Although

these small-pox death-rates are based upon proportional populations at the different life ages there is for the highest vaccination period 1868-72, an excess in the per million death-rate for each of the ages named, above the average for the 11 periods. From 0 to 5 years the average annual excess is 470 per million.

17,737. An excess over what?—Over the periodic average death-rate. You have 11 average annual death-rates given upon that table, one for each group of years. The periodical average is obtained by adding them together and dividing by 11.

17,738. The death-rates from small-pox?—Yes. This table deals wholly with small-pox, and the death-rates are calculated upon the population distributed according to the various life ages mentioned. The average death-rates for the 11 periods into which the table is divided are all exceeded in the high vaccination period.

17,739. Under which age?—Under all ages. The annual average small-pox death-rate, for 52 years are exceeded in the period 1868-72. From 5 to 10 years of age the annual excess is 971 per million. From 10 to 15 years of age the annual excess is 188 per million; and for 15 years of age and upwards the death-rate is 434 per million above the average annual rate for the 52 years. And the total death-rate from small-pox for the same period, when we were best vaccinated, is no less than 384 per million above the average. Dealing next with the relative per-centage of the per million rates on Table 45 we find a fall for the ages 0 to 5 years from 85·14 per cent. in the first period to 46·5 per cent. in period VII. From 5 to 10 years of age there is a rise from 12·68 per cent. in period I. to 34·46 per cent. in period VII. From 10 to 15 the rise is from 0·88 in period I. to 6·22 in period VII. Above 15 years of age the rise in the small-pox death-rate is from 1·30 per cent. in period I. to 12·82 per cent. in period VII. Although as a relative per-centage the rate rises in the next two quinquennia, it falls to 8 per cent. in period X.

17,740. (*Sir William Savory.*) Are these the tables you referred to at the last meeting as upsetting the figures that I called your attention to last time?—I do not know that I said that these tables would upset those figures, but they are part of the tables I referred to as upsetting the line of argument you were then pursuing.

17,741. But do you consider the figures you have just quoted are contradictory to the figures I called your attention to last time?—I have not made the comparison between the figures themselves; but if I have time I will do so during the course of the week.

17,742. (*Chairman.*) What is the next table?—The last table, Table 45, gave the small-pox deaths exclusively under the various ages named, while Table 46, which I will now hand in, gives them inclusively under 5, under 10, and under 15 years of age. (*The table was handed in. See Appendix III., Table 46; page 462.*) In the highest vaccination period, 1868-72, the death-rate under 5 years of age is 470 per million above the average annual death-rate for the 52 years. The death-rate over 5 years is 487 per million above the average annual rate. The death-rate under 10 years of age for the same period is 768 per million above the average annual rate; and over 10 years of age it is 402 per million above its average annual death-rate. Noticing the death-rate under 15 years of age for the same high vaccination period, we find it is 571 per million above the average annual rate; and for the ages above 15 years it is 434 per million above the average annual rate. A noticeable feature about this table is that up to all these ages the death-rate increases and is progressive from period 4 when vaccination became more fully practised; and from that time to the present we find that each of these small-pox death-rates reaches its maximum fatality actually when the amount of supposed protection from vaccination is the highest. The per-centage fall under 5 years of age is from 96·8 in the first period to 78·5 in period 10.

17,743. (*Mr. Meadows White.*) You say it is above the average annual rate; what is it?—The small-pox death-rate for the high vaccination period, 1868-72, is above the average periodic death-rate for the 52 years I am alluding to, distributed into 11 periods.

17,744. For Leicester only?—Yes, for Leicester only.

Adjourned till Wednesday next at 1 o'clock.

Mr.  
J. T. Biggs.  
15 July 1891.



## Seventy-fourth Day.

Wednesday, 22nd July 1891.

PRESENT:

THE RIGHT HON. THE LORD HERSCHELL IN THE CHAIR.

Sir JAMES PAGET, Bart.  
Sir CHARLES DALRYMPLE, Bart., M.P.  
Sir W. GUYER HUNTER, K.C.M.G., M.P.  
Sir EDWIN HENRY GALSWORTHY.  
Sir WILLIAM SAVORY, Bart.  
Dr. JOHN SYER BRISTOWE.  
Dr. WILLIAM JOB COLLINS.

Professor MICHAEL FOSTER.  
Mr. JONATHAN HUTCHINSON.  
Mr. J. ALLANSON PICTON, M.P.  
Mr. SAMUEL WHITEHEAD, M.P.  
Mr. F. MEADOWS WHITE, Q.C.  
Mr. JOHN ALBERT BRIGHT, M.P.

Mr. BRET INCE, *Secretary*.

Mr. JOHN THOMAS BIGGS further examined.

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17,745. (*Chairman*.) You were dealing with Table 46 when the Commission adjourned upon the last occasion; will you now proceed?—Resuming what I have to say upon Table 46; the table shows; (1) the total small-pox deaths under and over successive life ages, namely; under and over 5 years, under and over 10 years, under and over 15 years, and the total deaths at all ages; (2) the average annual small-pox death-rate per million living at such ages; (3) the relative per-centage of the death-rates per million for the 52 years 1838–89, in quinquennial periods; and (4) the average annual per-centage of registered vaccinations to total births 1849–89. I have already referred to the small-pox deaths under and over 5 years of age. Under 10 years of age the per-centage fall in the small-pox death-rate is from 97·7 in period I. to 85·7 in period X. In the ages under 15 the fall is from 96·6 per cent. in period I. to 80 per cent. in period X. None of these percentages at the younger ages can, I think, be regarded with much satisfaction by those who believe that vaccination has had the effect of reducing the mortality at the younger ages.

17,746. I am not sure that I quite understand your Tables 45 and 46; take any of the periods in Table 45. As what you call the “relative per-centage of the “per million rates” you give for under five years 85·14 per cent., and for over fifteen years 1·30 per cent.; relative per-centage to what?—The relative per-centage of all the death-rates in the same period to each other.

17,747. In your Table 46, for the same period of years, 1838–42, for the same age, under five years, your relative per-centage of the per million rate is 96·8 instead of 85·14, and over 15 years it is 3·4 instead of 1·30?—Yes, because the per-centage rates on the two tables your Lordship is now referring to, are not related to the same life ages. In Table 46 you find that the respective per-centages are taken for two different ages only; namely under five and over five years; under 10 and over 10 years; and under 15 and over 15 years; whereas the per-centages for Table 45 are distributed through all the different ages mentioned on that table.

17,748. Then these per-centage rates differ entirely according to the manner in which you split up your ages?—Yes, of course they do; I have divided it into two forms, so that it can be examined under both aspects. I will now hand in Diagram O. (which I had not with me last week) for the purpose of illustrating Table 44, which table I handed in at Question 17,729. (*The diagram was handed in. See Appendix III., Diagram O.; facing page 460.*)

17,749. Just one moment—on your Table 46; take the period 1883–87, total small-pox deaths under five years, one; over five years, two; I understand that that means that at whatever age they died the total number that died over five years was two?—Yes.

17,750. I see in the next column, under 10 years of age, two; I should have thought that two under 10 years—?—It includes the one under five years and one over five years; the “under and over” under each heading include the whole number of deaths.

17,751. Was the one over 10 years old over 15 years old too?—Yes, the one over 10 was also above 15.

17,752. (*Professor Michael Foster*.) Ought not that to be three?—It makes three as the total. One under five years of age, and two over five years; two under 10 years, and one over 10 years, making three; two under 15 years, and one over 15 years, making three. Resuming, my Diagram O. shows: (1) That the decline of the mortality at all ages (which had set in with the introduction of sanitary measures in the earlier periods of 1843–62) was checked, and that the mortality rapidly rises, particularly in the younger ages, concurrently with the increased enforcement of vaccination; (2) that the highest death-rate of children under five, under 10, and under 15 years (up to which ages especially it has been assumed that vaccination saves life) was coincident with the highest rate of infantile vaccination, 1868–72; and (3) that the above-mentioned increase of mortality under five, 10, and 15 years, the death-rate above 15 meanwhile declining, raised the all-age and all-cause death-rate to the highest point attained during a period of 40 years from 1849 when vaccination became more generally practised in Leicester; (4) that a notable and continuous decline in the mortality of children more particularly in the younger ages under five years, with a proportionate decline under the ages of 10 and 15 years, coincides with the rapid fall and general abandonment of vaccination (the fall being greatest in the youngest ages); and (5) that Leicester (which was formerly classed by the Registrar-General amongst the most unhealthy towns of the country), had an average annual death-rate in 1868–72 of 26·82 per 1,000 total population, when the per-centage of vaccinations was 91·7 to the total births; and that subsequently, when vaccinations had fallen to 5·1 per cent. to the total births, the average annual death-rate from all causes for 1888–89 had fallen to only 17·4 per 1,000 living. This is a remarkably low death-rate for a manufacturing town like Leicester, especially considering its geographical and geological position. It is now, therefore, grouped by the Registrar-General with towns having the lowest rate of mortality. The upper dotted black curve upon this diagram gives the average annual death-rate from all causes per 1,000 children living under five years of age; the upper solid black curve gives the average annual death-rate from all causes per 1,000 children living under 10 years of age; the lower dotted black curve gives the average annual death-rate from all causes per 1,000 children living under 15 years of age; the lower solid black curve gives the average annual death-rate from all causes per 1,000 living at all ages. The solid red curve shows the average annual per-centage of registered vaccinations to total births, and the space between the dotted red line and the solid red curve shows the additions for private vaccinations 1849–62. Each upright line represents the period of years mentioned at the base of the diagram. This diagram, which I regard as one of the most important, is based upon the age distribution of the proportional populations which I handed in on the last occasion. I will now hand in another table which gives the per-centage share of



deaths from small-pox and fevers of children under five and 15 years to deaths at all ages from such diseases, in successive quinquennial periods from 1849 (the first year of complete obtainable vaccination records) to 1889; and the average annual per-centage of registered vaccinations to total births. (*The table was handed in. See Appendix III., Table 47; page 463.*) This table enables the Commission to make a comparison between the deaths under five and 15 years from small-pox and the total deaths in Leicester from that disease, and also to compare the deaths under five and 15 years from typhus, typhoid, and simple continued fevers with the total all-age deaths from these diseases. In this table the numerators give the number of deaths under five and 15 years of age, and the denominators the total deaths at all ages from the specified diseases. If we compare the per-centage share of the total deaths from small-pox and fevers, for children under five years of age, we shall find that the proportionate rate of decline is greater for fevers than for small-pox. In other words, small-pox declines from 78·40 in Period I. to 33·3 per cent. in Period VIII., which taken on the higher figure gives a per-centage rate of decline of 57·48 per cent. Taking the same periods and ages for fevers, we find a decline in the death-rate from 26·40 to 10·71 for the children's share under five years. This gives a per-centage rate of diminution (taken on the higher number) of 59·43; thus showing a per-centage rate of diminution of about 2 per cent. more in the deaths of young children from fevers than from small-pox.

17,753. (*Chairman.*) I do not see those figures; are they upon this table?—This is a comparison between the figures of the periods I am alluding to.

17,754. Are you quoting figures which appear upon the table?—No; not all of them. These rates of diminution do not appear upon the table, but they are calculations made from the figures upon the table to show that the per-centage rate of diminution in the deaths of young children from fevers is greater than the rate of diminution for small-pox by about 2 per cent.

17,755. Are you taking under five years or under 15 years now?—I was referring to the deaths of children under five years of age. Perhaps it would be fairer in making these comparisons to take the highest per-centage under each disease and each age and compare it with the lowest. This would give for small-pox deaths a per-centage rate of diminution of the per-centage decline, for children under five years of age, of 68·1, and a per-centage rate of diminution in the per-centage decline in the deaths from fevers of children under five of 79·1, being a difference of 11 per cent. in favour of fevers as compared with small-pox. Comparing now the deaths of children, under 15 years of age, from small-pox, and from the group of fevers (typhus, typhoid, and simple continued fevers), the per-centage rate of diminution in the per-centage decline from small-pox is 46·1, while the per-centage rate of diminution of the per-centage decline from fevers under 15 years is 35·4. These per-centage rates of decline are all taken on the higher number (as compared with the lower number) for which comparisons have been made. The greater fall in the per-centage decline or decrease of the children's share under five years of age in the mortality from fevers as compared with small-pox is fully borne out by the returns of the Registrar-General for the whole country. Sir William Savory referred to this subject at a previous meeting.

17,756. I see you give the Commission "Typhus, typhoid, and simple fevers." Where do you get that classification—from the Medical Officer's report?—Yes. It is in the Medical Officer's report, and it is a classification generally used for such comparisons.

17,757. Where do you get your numbers from for this purpose under that classification?—The numbers are abstracted principally from the reports of the Medical Officer of Health for Leicester.

17,758. Where else are they taken from?—For the years prior to the issue of these reports they are abstracted from our local death registers.

17,759. Since the Medical Officer's reports commence you have taken them from the Medical Officer's reports?—Yes, I have taken them from the Medical Officer's reports as far as I could.

17,760. Are they taken from anywhere else?—Yes, for the earlier years.

17,761. I believe I am right in saying, though I am speaking from memory, that the Medical Officer does not give the ages under this classification?—Where this

is the case the ages have been obtained from the death register in the same manner as for the years before the health reports were issued at all.

17,762. By yourself?—By myself. I find that in the 11th volume of the "Vaccination Inquirer" there are a number of articles dealing with this particular subject. I might say at once that I have not tested the figures in those articles which are taken from the Registrar-General's figures, but this has been done by the writer of those articles himself. At pages 124 and 125 of the November number of the "Vaccination Inquirer," 1889, I find that for the period 1871-75 the per-centage share of deaths under five years to deaths at all ages from small-pox is 31·1; for 1876-80 it declines to 25 per cent.; and for 1881-85 it further declines to 23·4 per cent., being a per-centage rate of diminution in the decline comparing the first with the third quinquennium, of 24·75 per cent. For typhus the per-centage share of deaths under five years in the first quinquennium, 1871-75, is 6·5 per cent.; in the second quinquennium it is 6·1, and in the third it declines to 3·5 giving a rate of diminution in the per-centage decline for the young children's share of the death-rate of 45·31 per cent. taken on the higher figure. For typhoid the first quinquennium gives a per-centage share of the deaths under five years to the deaths at all ages from this disease of 17·4; the second period of 16·0, and in the third period this per-centage share falls to 9·3, giving a rate of diminution in the per-centage decline of the young children's share in the death-rate of 46·55 per cent. In a further table dealing with the same periods where chicken-pox is included with small-pox and remittent fever with typhoid, the rates are, for small-pox in the first period, 31·3; for the second period, 28·6; and for the third period, 27·2, or a rate of diminution in the per-centage decline of the young children's share of deaths from small-pox of 13·09 per cent. For typhoid the per-centages are 17·4 for the first period, 16·0 for the second period, and 11·2 for the third, giving a per-centage rate of diminution in the per-centage decline of 35·63 per cent., taken on the higher number. For typhus the per-centage for the first period is 6·5; for the second period, 6·1; and for the third 3·5, being a per-centage rate of diminution on the per-centage decline of 45·31 per cent.

17,763. That is the same as before?—Yes, I believe the numbers are exactly as before, being a per-centage rate of diminution of 45·31 per cent. In the first table we get a rate of diminution of 21·18 per cent. more for fever than for small-pox.

17,764. For those particular fevers you mean?—Yes.

17,765. Not fevers generally, because that takes no account of scarlet fever?—It takes no account of scarlet fever. In the second table, which includes chicken-pox with small-pox and remittent fever with typhoid, we find even a greater proportionate decrease of the children's share of the death-rate from these diseases than from small-pox. This rate of decline in the per-centage share of mortality under five years is 27·38 per cent. greater in favour of fevers than the per-centage rate of decline for small-pox.

17,766. You take no account of the argument that sanitary improvements were more calculated to have an effect upon typhoid and typhus than they are upon small-pox, that small-pox is rather comparable to scarlet fever and some other fevers than to typhus and typhoid?—May I ask do you mean with reference to the diminution of these death-rates, whether I believe that sanitary improvements have had an effect upon all of them equally?

17,767. Yes?—Undoubtedly. I know of no valid reason why one of these zymotic diseases should be exempt from the beneficial influence of sanitation more than another. I think it has an effect upon them all. There is one other observation I should like to make upon this article, namely, to call attention to a paragraph under the second table, which says: "In 1886 and 1887 the correction for chicken-pox raised the children's share of small-pox mortality for those years to 34·2 per cent. That is to say, there were in those years 961 deaths from small pox and chicken-pox together, whereof 329, or 34·2 per cent., were of children under five. But since 1881 the Registrar-General has put in a class by themselves all the small-pox deaths returned as 'unvaccinated'; and of these, the record for the two years in question stands at 154 deaths, whereof 51 were under five, or 33·1 per cent. So that the children's share of small-pox mortality among the unvaccinated has actually,

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"for the last two years of record, been lower by 1·1 per cent., than their similar share in the small-pox mortality of all the classes, vaccinated, unvaccinated, and unknown together. Or, to put the thing another way, the effect of a very general practice of vaccination amongst a community has been to raise by 1·1 per cent. the amount of the children's share of the small-pox mortality of the whole community above the similar share among that portion of it which has declined vaccination."

17,768. (*Professor Michael Foster.*) That is to say, vaccine has caused small-pox?—I do not understand that from the reading.

17,769. I thought it was to be inferred that vaccine had raised the proportion?—Yes, that it raised by 1·1 per cent. the amount of the children's share of small-pox mortality as compared with the unvaccinated.

17,770. That is to say, a larger number of children were [susceptible of small-pox?—Yes; under any circumstances they were not rendered less susceptible. According to the Registrar-General's figures they were rendered more susceptible of dying by small-pox to the amount of 1·1 per cent.

17,771. The meaning of it is that vaccination has rendered young children more susceptible to small-pox?—Yes; at any rate it has not diminished their susceptibility.

17,772. (*Dr. Collins.*) That conclusion, I understand, has been arrived at by regarding deaths from chicken-pox as deaths from modified small-pox?—Yes, I believe that was the case.

17,773. I observe on page x of the 52nd Annual Report of the Registrar-General that he states that "the deaths from small-pox amounted to the unprecedentedly low number of 23, and were less than one-tenth of the smallest number recorded in any previous year. There were, however, 83 deaths ascribed to chicken-pox, and it is very probable that most of these were in reality cases of modified small-pox, true chicken-pox being an ailment that is rarely, if ever, fatal." Was that the point you were drawing the attention of the Commission to?—Yes, I believe chicken-pox was included in this number, because the extract read from the "Vaccination Inquirer" follows the table I quoted last, namely, the table including chicken-pox with the small-pox deaths.

17,774. I understand you to be instituting in these tables you last put in a comparison between small-pox and fever as regards the age-incidence of mortality in either?—Yes, that was my object in putting them in. I wanted to show that the allegation so frequently made that vaccination has had the effect of reducing the children's share in the death-rate from small-pox has no foundation in fact; because we find that a similar, or even a greater rate of decline has taken place in the death-rate from fevers, and no one ventures to claim that this decline is due to vaccination. The decline in the death-rate for both these kindred diseases is no doubt due to the same cause, and that cause appears to be improved sanitation.

17,775. Do you agree with the answer given to me by Dr. Ogle in answer to Question 518, when he said, "It is impossible to make similar comparisons in the case of scarlet fever or measles, and diseases that only affect children. Fever is the only one of the zymotic headings that you can take, because it is the only one that affects all ages to any extent. Fever is, therefore, the only one which it is possible to subject to this kind of investigation, and I have done it for that?—Yes; I fully agree with Dr. Ogle in that opinion.

17,776. (*Sir William Savory.*) Do you consider that what you have just mentioned has dealt with my previous question?—Yes; it is dealing with the same subject as that you referred to when you gave me certain quotations from the Registrar-General.

17,777. I do not want to delay you, I only want to understand where I am; do you consider you have replied to that?—Yes, I consider that the evidence I have put in is an ample reply to the argument you placed before me. You quoted certain figures which had been abstracted from the Registrar-General's returns which showed that there was a continuous decline going on in the per-centage share of the death-rate of children under five years of age from small-pox.

17,778. That is not exactly the point; the point is that in the three decennial periods 1851–60, 1861–70, and

1871–80 there is a striking diminution in the share of the total small-pox mortality borne by children between the ages of one and five years, and also in the death-rate from small-pox at this age?—That is as I understood it. The question you are alluding to is Question 17,502, in which you give three decennial periods 1851–60, 1861–70 and 1871–80, with the corresponding figures. I suppose those rates of per-centage show the deaths of children under five years of age, do they not?

17,779. Not under five years, between the ages of one and five, which seems to be an important distinction with regard to the fact of vaccination?—Would you kindly tell me whether those figures include the deaths under one year as well as the deaths between one and five years?

17,780. To shorten the discussion, I will refer you to Question 17,510; I asked you, "How do you explain the fact?" and your answer was, "I think it is quite possible, in fact I know from the statistics you have just read, and I have no reason to doubt that there is a saving of life from small-pox at those younger ages." So that you admit that?—Decidedly.

17,781. Then I ask "From vaccination," and you say, "No, I do not admit that." Then I ask, "From what?" and you say, "In all probability I shall be able to produce some other figures which would run concurrently with yours, and which would entirely upset the line of argument you are now pursuing." I cannot see where it is upset?—But I understood you to imply that the decline in the death-rate from small-pox at the younger ages was due to the influence of vaccination. I have now produced figures, which in my judgment entirely upset that line of argument.

17,782. I produced figures from the Registrar-General's return showing a decline in the deaths from small-pox at the younger ages?—Do you affirm that this decline was entirely caused by the practice of vaccination?

17,783. I only put the fact before you, and ask you for an explanation of it. It is so very remarkable that in those two periods, 1861–70 and 1871–80, there is a decrease in the share of the total small-pox mortality borne by children between the ages of one and five of 53·3 per cent., the actual fall in that share for those two periods being from 37·5 per cent. to 17·5 per cent. These figures are calculated from the Registrar-General's reports. I ask for an explanation of that very striking diminution of 53·3 per cent.?—But in order to understand the purpose for which you made that quotation I should like again to ask if the decline is ascribed to vaccination.

17,784. I do not think that is in the least needful; you are dealing with these facts, and I call your attention to this very striking fact and ask you if you can offer any explanation of it?—I have now put in tables which show that the same process has been going on in Leicester, and that even after vaccination was abandoned it has continued at an accelerated ratio. I have also put in tables to show that precisely the same process of diminution of the death-rate for the younger ages has been going on with reference to fevers, and, therefore, unless the contention is made that vaccination controls fever as well as small-pox, I cannot see that any claim for vaccination can be put forward on behalf of the figures which you have quoted.

17,785. May I ask your attention to the table I have here, which shows the fall or rise from 1861–70 to 1871–80 in Leicester in the share of the total small-pox and fever mortality borne by persons at certain ages? On comparing, for small-pox and for fever, the share of the all age mortality borne by children under the age of one year in those two periods it appears that the diminution in the later period in the case of small-pox is 31, and the diminution in the case of fever is 41 per cent. Now between the ages of one and five the diminution in small-pox is 53·3, the diminution in fever is 28·5; then from five to ten years the increase in small-pox is 45·3; the diminution in fever is 12·8; from 10 to 15 years an increase again in small-pox of 19·3, in fever it is 8; and from 15 years to 20 the increase in small-pox is 80, and the increase in fever is 29. So you see there is not a correspondence between small-pox and fever. The diminution in small-pox at this particular age and at this particular period is a very striking fact, and has no parallel in the diminution of fever?—Without having before me a copy of the table from which you are quoting, and upon which your argument is based,



I should not feel justified in offering a decided opinion, but judging from your reading of the figures I think it has a parallel in the figures I have quoted.

17,786. (*Chairman.*) Your figures are under five and over five years; under five years would include those between 0 and 1. Sir William Savory's figures deal separately with those between 0 and 1, and between 1 and 5?—I clearly understand the slight difference to which your Lordship alludes, but there are very few small-pox deaths under one year, and so the principal part of my figures like his would come between 1 and 5.

17,787. Of course in recent years the small-pox deaths have been so very small in number in Leicester that a per-centage is absolutely worthless, that is to say, a per-centage of one out of eight, or two out of eight, or one out of three, is not a sufficient range to be of any value?—I thought that in dealing with 52 years I had taken a sufficiently wide range. There is a fall from the first period to the fifth, at which period we had a very large number of small-pox deaths, since which time the decline has been so great that we have, happily, no small-pox deaths now to deal with.

17,788. But you would not suggest that those averages are worth much when you come to deal with numbers under 10 in relation to such a large population as that of Leicester, would you?—I have not introduced any comparison of the averages from this table.

17,789. At Table 47 you have?—No, not of the averages. I am speaking of Table 47.

17,790. Of the proportions?—Yes, of the per-centage proportions, and I do not know why they should be treated as valueless.

17,791. I thought everybody was agreed that when you were dealing with small numbers out of great, to deduce any general results from them was not very safe?—I do not think it is, but we are frequently asked to accept conclusions in favour of vaccination based upon numbers equally small, as compared with the population. The argument I am using would apply to very large numbers comparatively so far as small-pox is concerned, as will be seen, taking them from period I. to period V. on my Table 47. Of course since that time we have had very little small-pox in Leicester, so that it is exceedingly difficult to make any comparison in regard to it.

17,792. So that the safer thing would be to take a wider and more general range instead of confining your answer to Leicester?—No doubt, but the wider range, taking the Registrar-General's figures, seems to teach the same lesson. I should think it is in our favour that we have had so few small-pox deaths for many years past.

17,793. I was only suggesting that in these later years the figures were so small that the results were not of very great value?—They are small undoubtedly, but I cannot admit that this detracts from the value of my tables. From our point of view it rather enhances their value. There appears to be a decline going on not in small-pox only, but in fevers also, both apart from vaccination.

17,794. (*Dr. Collins.*) I understood from the figures Sir William Savory put to you that the latter period compared with the former as regards small-pox indicated a rise in the per-centage proportion at the ages between five and ten; have you any suggestion to make upon that point?—In regard to the rise in the per-centage of deaths from small-pox at the higher ages, all I have to say is that I cannot see what the community at large gains from an alleged saving of life in the younger ages if it is accompanied by an increased small-pox death-rate amongst adults or at the higher ages, that is, supposing the death-rate referred to is actually increased, and not simply that the increase is in the relative proportion under a particular age.

17,795. (*Sir William Savory.*) I was not troubling you in the least degree with that—it is not part of my argument at all—I was only calling attention to the fact that at a particular period between certain ages there is a remarkable diminution in the share of the total mortality from small-pox, according to the figures, so far as we read them?—It is equally remarkable that a similar diminution appears to go on in the particular town referred to where vaccination has been abandoned, so that I fail to see any force in the argument.

17,796. I do not think it does appear to go on, it appears to stand quite alone in these reports I have

handed to you?—From these reports you get larger numbers to deal with, yet they seem to teach the same lesson, but I cannot admit for a moment that the decline is due to vaccination.

17,797. You have said that several times. I want to know if you can account for it. It does not seem to me that up to the present you have given me a satisfactory answer, but I do not wish to pursue the subject?—I have shown that the decline cannot be attributed to vaccination, and that there was a concurrent decline for fevers, which no one presumes to attribute to vaccination. I account for the decline in both death-rates by our improved sanitation.

17,798. (*Dr. Collins.*) Do I understand it to be your point that the sanitary efforts, to which you attribute the decline in fevers, have similarly operated in the case of small-pox?—Yes, we believe so in Leicester.

17,798a. (*Sir William Savory.*) Then I say that is contradicted by the table I have read, which you have before you, because it shows that there has not been a similar diminution of fever?—On the contrary, my Table 47 shows that the proportionate decline in fevers has been greater than that for small-pox at all the younger ages.

17,799. (*Dr. Collins.*) Would you agree with the Registrar-General's 42nd report in which he states that "it is against noxious influences to which the young are more especially sensitive that the weapons of sanitary reformers have been chiefly directed"?—I should, most unquestionably.

17,800. Do you think any improvement in sanitary measures which would affect the decline in the mortality from fevers and small-pox would be likely to operate in the direction of rendering the younger ages still more immune from those diseases?—Yes, I think it would from all the principal zymotics, and therefore from the two you mention.

17,801. (*Chairman.*) Would you say it makes any difference as regards this question of the effect of sanitary measures whether disease is infectious or not?—I think it unquestionably makes some difference.

17,802. (*Dr. Collins.*) Do you think that the introduction of measures which would tend to restrict infection would be likely to have any effect upon the age incidence of infectious disease?—Yes, I think it would, especially in the case of young children.

17,803. Tending to make the younger ages less liable?—Yes, the younger ages less liable, but rather by causing a decrease in the amount of infection to which they might have been exposed.

17,804. (*Mr. Meadows White.*) Was there any change in the water supply of Leicester in the period covered by your Table 47?—Yes, there would be a change within that period. The establishment of water-works for the borough of Leicester was originally projected by a private company in 1846, and an Act of Parliament was obtained in the following year. Water was first brought to Leicester from the Thornton reservoir, which was constructed under the Act of Parliament which the company obtained, on the 21st of December 1853.

17,805. Has there been any change since or has the supply been extended?—The supply has been extended on two occasions. A Water Bill was passed last year for further extension; but practically the supply has remained the same in quality and in proportion to the population, and it has been found to be fairly adequate.

17,806. (*Chairman.*) If you take the periods, given in your Table 47, before the very small figures begin in the sixth period; if you take the first five periods where the numbers were considerable more or less, is not there a much more marked diminution in small-pox in the share of the mortality borne by children under five years than in any of the other cases to which you drew attention, namely, fevers at either age? If you look you will find that the share of the small-pox mortality borne by children under five years diminishes from 78 per cent. to 32 per cent., the period of 1868-72 being one when you say small-pox was at its highest; while under 15 years it declined from 92 to 57 per cent., and then if you take fevers under five years, in those periods they diminished only from 26 to 21 per cent., and under 15 years from 49-38 to 49-31, practically no diminution at all; so you do find in the case of small-pox whether under five years or under 15 a much greater diminution than you do in the case of fevers; and you find the diminution

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in small-pox greatest under five years and much greater under five years than in fevers either under five years or under 15?—That is so, if you compare the decline over a more limited period than I have done, and apart from a consideration of the per-centage proportion of the decline itself in the two death-rates.\*

17,807. In the subsequent periods you come to periods when the deaths from small-pox were so small that it is very difficult to found a comparison upon them; they are four out of nine, two out of eight, or one out of three, which it has been suggested to the Commission would be rather a dangerous comparison to found an argument upon?—Still the decline is continued as shown by the figures quoted by Sir William Savory. In the first period, quoted by your Lordship, the deaths from fevers under five years and under 15 had neither of them reached their maximum. If you take the first period the fevers under both ages are lower than they are in the second, under 15 years of age they are higher in the third period than in any other, after which the decline sets in; so that the decline appears to set in later for fevers than for small-pox. Comparing for small-pox, the ages under five and under 15, it will be found, singularly enough, that the maximum proportion of the death-rate above five and under 15 years was not reached until the fourth period. I will now hand in another table giving the number and per-centage of deaths from small-pox under five and under 15 years of age to the deaths from all causes under five and 15 years, with the average annual per-centage of registered vaccinations to total births, in quinquennial periods, from the first year of complete obtainable vaccination records, 1849 to 1889 inclusive. (*The table was handed in. See Appendix III., Table 48; page 463.*) In this table the numerators give the total deaths from small-pox under five and under 15 years, and the denominators give the total deaths from all causes also under five and under 15 years. The per-centage of deaths under five from small-pox to the all-cause deaths under the same age, for the same period, 1849–52 was 3·16. In the next period it had fallen to 0·50. Notwithstanding the increase of total deaths from all causes under five years the relative per-centage of small-pox deaths under five also increased for three successive quinquennia; and if we except the first period the relative per-centage of small-pox deaths under five reaches its maximum in the highest vaccination period 1868–72. Similar observations apply to the deaths under 15 years.

17,808. But with vaccination comparatively little altered, that is to say, going down only from 91 to 80 per cent., and then going down to 66 per cent. the proportion of deaths falls immensely notwithstanding that there is still 80 per cent. of vaccination, does it not, namely, from 1·74 to 0·06, which was much lower than it had ever been before?—Yes, it was much lower for the period which immediately succeeded a very severe epidemic.

17,809. (*Dr. Collins.*) These figures only represent the relationship between small-pox deaths and the all-cause deaths?—That is all they were intended to represent. My next table, Table 49, gives the per-centage share of our deaths at all ages from small-pox, fevers and the seven principal zymotic diseases to the deaths from all causes at all ages, in quinquennial periods from 1838–83, with the average annual per-centage of registered vaccinations to total births 1849–89. (*The table was handed in. See Appendix III., Table 49; page 464.*) Taking small-pox first, we get the highest per-centage of deaths in the period of highest vaccination, namely, from 1868–72. For fevers there is a fall, not quite regular but generally continuous, from the first period to the sixth, 1863–67, when the decline appears to be checked by some cause, as it remained stationary in the high vaccination period, after which the decline again sets in and continues to the tenth period. For the seven principal zymotic diseases the per-centage share of deaths from these diseases to the deaths from all causes also reaches its maximum in the highest vaccination period, and afterwards falls to a very low rate when vaccination is practically abandoned.

17,810. (*Chairman.*) It does not fall nearly so low as small-pox apparently, does it? In the period 1868–72 and 1873–77 there is a much greater fall in small-pox

than there is in the seven principal zymotic diseases?—The decline in the small-pox death-rate is greater than that in the seven zymotics, but for the years 1868–72 both of them reach their maxima.

17,811. And I say there is a greater fall in small-pox in the next two quinquennia compared with a smaller fall in the seven principal zymotic diseases?—Yes, but it is rather a rapid fall in the seven zymotic diseases, from 25·60 to 13·67.

17,812. The fall, in the periods to which I refer, in the case of the seven principal zymotic diseases, according to your table, is from 25·60 to 19·65 and then to 19·32, while in the case of small-pox it is from 2·88 to 0·07 and then to 0·06; that is a much greater fall, is it not?—Yes, proportionally. From period seven to period eight there is a fall, but in the period seven you have the great small-pox epidemic of 1872; and in period eight you practically have no small-pox at all, there being very few deaths indeed.

17,813. Do the seven zymotic diseases include small-pox?—Yes, small-pox is included in the figures for the seven zymotic diseases.

17,814. Then of course they operate upon the seven zymotic diseases figures?—Yes.

17,814. (*Dr. Collins.*) Do the seven zymotic diseases include diarrhoea?—Yes.

17,816. That is not liable to the same epidemic fluctuations as small-pox is?—No, diarrhoea is liable to fluctuations, but not to the same proportionate extent as small-pox. Our maximum death-rate from the seven principal zymotics to which diarrhoea contributed the principal share appears to have been reached, and was to a very large extent influenced by the epidemic of small-pox, 1871–72, at a time when vaccination was very largely practised. Of our total death-rate for the last 52 years the per-centage share borne by small-pox and the seven principal zymotics, was greatest in the highest vaccination period 1868–72. Since vaccination has declined, the share of small-pox in the total death-rate from all causes has also declined, and there is a similar decline for fever, and also for the seven principal zymotics. The rate of diminution in the per-centage decline of small-pox deaths from the highest to the lowest period of its fatality is no less than 99·3 per cent. This is excepting the last period when small-pox has disappeared altogether, and when the fall in the per-centage would of course be 100 per cent. Both these rates of decline are obtained by comparing the highest vaccination period which was most fatal for small-pox with the lowest vaccination period which was least fatal for small-pox. For fevers, from the highest to the lowest period of their fatality, the rate of diminution in the per-centage decline is 80·9 per cent., taken on the higher number, and for the seven principal zymotics the rate of diminution in the per-centage decline from the period of their highest fatality (1868–72), when vaccination was 91·7 per cent. to total births, to the period of their lowest fatality (1888–89) when vaccination had fallen to 5·1 per cent. to total births, is 46·6 per cent. As these reductions have continued, in Leicester, into periods which are less and less affected by vaccination, and as they are also borne out by the Registrar-General's returns, it would appear that some general and beneficial influence has been, and is still, in process of operation affecting all these diseases alike, and lowering their death-rates. It is an eloquent fact that our decline in small-pox has been most marked since we left off vaccinating, which could not possibly be the case if vaccination were the sole factor regulating the diminution, as believers in vaccination assert.

17,817. (*Chairman.*) How do you mean that the decline "has been most marked since we left off vaccinating"? I should have thought that the fall between the seventh and eighth periods was more marked than the fall from the eighth period to any subsequent one?—It could not be more marked than the comparison with the last period of all when we had no small-pox deaths.

17,818. From 359 deaths by small-pox during the seventh period you go down to nine in the next period. I should have thought that was more marked than a decrease from eight to three and then to nothing?—For the last few years we have had no small-pox to consider at all.

17,819. I was taking two of the periods here, the fall was just as marked surely between the seventh and eighth periods?—But that, as I pointed out, was imme-

\* If periods are selected arbitrarily for purposes of comparison very different results might be obtained. For instance, taking period I. and IV. instead of period I. and period V., the figures given in my Table 47 show a much greater relative decline in favour of fevers.—J. T. B.



diately after the epidemic, which having exhausted itself was one great cause of the fall.

17,820. (*Sir James Paget.*) Was not it also immediately following upon the largest vaccination?—Yes, it was following that too. The next table, which I will now hand in, gives the per-centage share of deaths from all causes of children under five and under 15 years, to the total deaths at all ages and from all causes, in successive quinquennial periods from 1838 to 1889; with the average annual per-centage of registered vaccinations to total births, 1849–89. (*The table was handed in. See Appendix III., Table 50; page 464.*) The principal feature in this table is that at the highest vaccination period 1868–72, when it was assumed that vaccination was saving the younger lives from death by small-pox, the maximum per-centage share of deaths is reached both for children under five and 15 years as compared with the total deaths at all ages and from all causes. Since that fatal vaccination period a regular and continuous decline in the death-rate has set in under both the younger ages of five and 15 years. With increasing vaccination, the children's share of the death-rate increased, and with decreasing vaccination the children's share has decreased. Had the same high death-rate prevailed in 1888–89 which prevailed in 1868–72, our increased annual loss of life of children under five years would have been 123, and under 15 years it would have been 164, or for five years, at similar rates 615 extra deaths of children under five years and 820 under 15 years.

17,821. (*Chairman.*) But if you pursue your comparison a little closer does not that suggest a doubt whether the proportion of deaths under five to those at all ages did go up and down with vaccination. In the third period 1848–52, which is the first in which you have the vaccination rate, your proportion of deaths under five per cent. of those at all ages, is 48, the per-centage of vaccinations being 62·8; the vaccinations then go up to 80, the per-centage of deaths still remaining at 48; the vaccinations then come down to 65, and the per-centage of deaths goes up to 49; the vaccinations then go up to 76, which is still below the rate you give for your fourth period, while the per-centage of deaths under five years goes up to 51, which is considerably higher than the per-centage given by you for your fourth period; then the vaccinations go up still further to 91, and the per-centage of deaths goes up to 54; but in the next period when the vaccinations come down to 80 the per-centage of death is still 52. Then the vaccinations come down to 66, and the per-centage of death is still 51·97, higher than it was in the sixth period when the vaccination rate was 76. Does not that suggest a doubt whether there is that connexion which you indicate between the vaccination rate and the proportion of deaths under five years to those at all ages?—If you expect the death-rate to vary exactly according to the vaccination rate it might; but you find there is a considerable rise in the third period, the period after the vaccination rate is first given in the table when there is a rise from 46·42 to 48·19.

17,822. But the returns are incomplete; we do not know what the vaccination per-centage was in the second period, so that we have no means of comparison. We do not know that it was not as much as 62?—Still you have the fact that there was an increase.

17,823. In the next quinquennium you have the vaccination rate going up from 62·8 to 80·2, a very great increase, with only an infinitesimal per-centage of increase in the deaths under five, only 0·26 with a great increase in vaccination?—But the fact remains that it does gradually rise until it reaches the maximum proportion of deaths under five years in the highest vaccination period of 1868–72.

17,824. (*Sir James Paget.*) In the next period, your fifth period, the vaccination falls and the mortality rises; however, those variations do not appear to you to be of any importance?—I think they are of importance, but I think they would be of tenfold greater importance if similar comparisons were made between the vaccination rate and the small-pox death-rate, because when we get to 91·7 of vaccination we have the very highest small-pox death-rate.

17,825. (*Mr. Meadows White.*) Was not that caused by the very severe epidemic of small-pox in 1872, which would have caused a considerable number of vaccinations?—Yes, no doubt, but the highly vaccinated condition of Leicester ought to have “protected” us from the attack.

17,826. (*Chairman.*) Taking your tenth period your vaccination drops to 29·9, and your proportion of deaths under five years per cent. of those at all ages is still 51·83, which is rather higher than it was in your sixth period, when your vaccination rate was almost at its highest, namely, 76·9; at least at the fourth highest period?—But it is going in the right direction; the per-centage of deaths at the younger ages is falling all the way down to 1889. They go up to a point together and then fall from that point.

17,827. (*Dr. Collins.*) Questions have been put to you suggesting that the “mortality” as shown in Table 50 indicates fluctuations which are inconsistent with your suggestion that vaccination is a part cause; am I right in saying that the per-centage figures given in the third column of Table 50, merely indicate what proportion of the total number of deaths happened under five years of age?—That is all, it gives only proportionate per-centages of the death-rate, and not rates per 1,000 population.

17,828. They are not in any sense a mortality rate, are they, indicating the proportion of deaths to persons living at that age?—No, they only show the per-centage share borne by those ages whatever the actual number of deaths may have been.

17,829. You would not suggest, I apprehend, that the complete abandonment of vaccination would reduce the per-centages of deaths under five to the total deaths to 0?—Decidedly not, but it would probably still further reduce their per-centage share of the total death-rate.

17,830. Do you give in Diagram N. as illustrating Tables 37 and 39 the actual mortality rates showing the average annual deaths of children under three months, under six months, and under one year to 1,000 births in quinquennial periods from 1838 to 1889?—Yes.

17,831. Do you consider that conclusions based upon such tables would be more valuable as testing the question whether vaccination is or is not a part cause of infantile mortality?—Yes; I should think they would be a better test, taken in connexion with my other tables, but I could scarcely agree that they would be the best test taken alone. They would be a better test as between the tables you are now alluding to.

17,832. (*Chairman.*) My questions were only directed to your Table 50 with which you were dealing. I am not saying that your arguments with respect to other tables are not correct, but I am dealing with the argument to be derived from this table?—This table shows that the death-rates for the ages of over 5 and under 15 years have declined at a more rapid rate than those under 5 alone, but all have declined.

17,833. (*Mr. Bright.*) On the question Mr. Meadows White asked you I would ask you this: Is it the case that the high rate of vaccination in the period of 1868–72 was consequent upon an epidemic of small-pox, or did it precede the epidemic of small-pox?—The epidemic of small-pox would tend to raise it, and undoubtedly did raise it somewhat; but from 1868 on to 1872, that is, for the four years preceding the outbreak of the great epidemic, there was a very much higher rate of vaccination than for any preceding period.

17,834. A very high rate of vaccination during the years preceding the appearance of the epidemic?—Yes, a very high rate of vaccination for the four years preceding the appearance of the epidemic.

17,835. (*Chairman.*) The epidemic broke out in 1870 in Leicester, did it not?—No, not until the latter end of 1871; there were 12 deaths, I think, in 1871.

17,836. (*Professor Michael Foster.*) The per-centage of vaccinations to births in 1872 and 1873 is only 85 and 83, as against 86 in 1869; I am referring to your Table 32?—I am afraid the table you have is not a revised copy of the table; the figures that were down under the first calculations that were made on vaccination were, for 1872, 85·8, and for 1873 they were 83·8. But under the new system of distributing the vaccinations as actually performed within each year irrespective of age, these rates becomes 107·1 and 83·0 respectively.

17,837. (*Dr. Collins.*) Whereas in 1868 they were 88·6?—Yes, but under this system the rate for that year will be 94·2.

17,838. (*Professor Michael Foster.*) I do not see the great increase of vaccination in 1872–73?—I stated that there was a great increase of vaccination in 1868 and that for the four years preceding the small-pox

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epidemic of 1872 there was a very high annual vaccination rate; it jumps up from 1867, when it is 43·2, to 94·2 in 1868.

17,839. (*Chairman.*) If the protection be assumed to last for five years, would not the protection have been much greater in 1873 than it was in 1872, if prior to 1868 vaccination had been so imperfect?—I should think it would be greater in 1873. Diagram P., which I will now hand in as illustrating Table 49, shows in quinquennial periods (1) the proportion of deaths from small-pox, fevers (typhus, typhoid, and simple continued fevers), and the seven principal zymotic causes out of every 100 deaths from all causes; (2) a great rise in the per-centage share of small-pox and zymotic mortality which was concurrent with a similar rise of the per-centage of vaccinations; (3) that the highest mortality from small-pox and the greatest mortality from the seven zymotics corresponds with the highest period of vaccination, 1868–72, and (4) an enormous fall in the per-centage share of the seven principal zymotics, a low average mortality from fevers, and the entire disappearance of small-pox coincides with the rapid decline and almost entire rejection of vaccination at Leicester. The lower solid black curve represents the average annual per-centage of deaths from small-pox at all ages to the average annual deaths from all causes at all ages. The dotted black curve represents the average annual per-centage of all age deaths from the group of fevers mentioned, to the average annual all-age deaths from all causes; and the upper solid black curve represents the average annual deaths from the seven principal zymotics to the average annual all-age and all-cause deaths. The solid red curve shows the average annual per-centage of registered vaccinations to total births. (*The diagram was handed in. See Appendix III., Diagram P.; facing page 464.*) This diagram displays these respective death and vaccination rates in a more graphic form than is possible on the table. I wish now, with your Lordship's permission, to hand in a table for the purpose of explaining the scheme of vaccinations we are now using. (*The table was handed in. See Appendix III., Table 51; page 465.*) Table 51 gives the annual number of public vaccinations for the years 1849 to 1889, ending with September in each year. It also shows the number deducted from and added to each year, for the purpose of adjusting the totals to end each year on December 31, and gives the annual number of public (after adjustment), private and total registered vaccination for each year (1849–89) ending with December 31, with full explanatory notes for years of special vaccinations. And it also gives, in the last three columns, the annual rates of vaccinations which have been used in my diagrams and tables. These rates are calculated on the per-centage of vaccinations to total births, to 5,000 births, and to 100,000 population. Table 26, which I have already handed in, gives the rates in Table 51 arranged in average annual rates for quinquennial groups of years, (*See Appendix III., Table 26, page 444.*)

17,840. This Table 51 is explaining where you get the materials from?—Yes, explaining where I got my materials from, there is a full explanation on the table. There is that question of Sir Guyer Hunter's which was left over.

17,841. (*Sir Guyer Hunter.*) What is it you wish particularly to refer to?—To Question 16,527. Referring to myself the statement there made by you is this: "I think you made a statement in the 'Vaccination Inquirer' in 1888, that the general mortality for 1872, excluding small-pox, was exceptionally low, but with small-pox, which according to your statement included 312 deaths, the total was 104 above the previous year, and 196 above the succeeding year." I have looked in the "Vaccination Inquirer," and I am unable to find that I made any such statement. Then you go on to say: "1872 was in fact the highest but one of the decade as regards total mortality, but you give, if you recollect, in that 'Vaccination Inquirer' 10 years in which you put it down that in 1872 the general mortality was no higher than in healthy years, whereas it was considerably higher than in any of the whole decade except 1875." I have also looked into this and I find that there is another year besides 1875 in the same decade which had a much higher mortality than 1872, namely the year 1880.

17,842. That is the year 1875 to which you allude, I suppose, but the increased mortality in 1875 is due to the epidemic of scarlet fever and also whooping-cough

and diarrhoea, which caused a considerable number of deaths?—Would you kindly refer me to the statement of mine that you refer to as to the low mortality for 1872.

17,843. You will see your reply to Professor Michael Foster at Question 16,184. The question put to you was, "Do you know what the small-pox mortality was per month for the year 1872?" to which your answer, as given in the proof of the minutes of your evidence which I have now before me, was, "The whole mortality of the year was very high, but I cannot tell you what it was month by month, except from these extracts from the newspaper. When we say the town was very healthy and that the number of deaths was no more than if we had no epidemic." That I conclude is the statement?—But that statement of the newspaper has nothing whatever to do with the statement you allege I made in the "Vaccination Inquirer."

17,844. But that resulted from what had gone before with reference to the questions which I put?—The statement you are alluding to as being made by me is a quotation made by me to the Commission from a newspaper and not any statement I made on my own behalf.

17,845. But this extract from the "Vaccination Inquirer" is signed "J. T. Biggs," which I presume is yourself?—Yes, but would you kindly tell me where I may find the statement you allege I made in the article in the "Vaccination Inquirer," because I have again read the article through and I am unable to find it.

17,846. It is at the bottom of page 204 of the "Vaccination Inquirer" of March the 1st, 1888?—That refers to diarrhoea, does it not; it has nothing whatever to do with the general death-rate of Leicester for particular years.

17,847. It is the death-rate generally, it does not refer to diarrhoea. If you choose to withdraw the statement?—No, I have nothing whatever to withdraw, I simply want to know what is the basis of your allegation that I made such a statement.

17,848. If you wish to withdraw it I will withdraw my question?—I have nothing whatever to withdraw, as the statement you allege I made cannot be found in the article.

17,849. (*Chairman.*) You say whatever inference may be drawn from it you did not mean to make it, and that you do not wish it to be understood as what you said?—Not exactly that; a distinct allegation has been made in the question put to me as to a statement I am supposed to have made.

17,850. The member of the Commission who asks whether you made it says that is his understanding of what is involved in the statement you have made, you cannot prevent his so understanding it, can you?—Decidedly not, but I should like to have the statement upon which he bases that understanding.

17,851. (*Sir Guyer Hunter.*) The statement is this: At the bottom of page 204 there is a table of population and deaths for the decade 1867–76, then a similar table for the decade 1877–86, and then this statement: "Average death-rate, first decade, per thousand about 25; second decade about 21." It is from that I drew the inference that you stated what you did, but I have not the slightest wish to pursue the question I do not wish to say anything more upon it?—But that is not the statement originally alleged against me. Turning to the table to which my attention has now been called it appears that I had distinctly put down the figure for the deaths in 1872 as higher than that for any of the other years of the decade excepting two.

17,852. (*Dr. Collins.*) You wish to put it on record that you emphatically deny that you made a statement in the "Vaccination Inquirer" of 1888 that the general mortality for Leicester for 1872 was exceptionally low as attributed to you in Question 16,527?—Yes, I emphatically deny it, because I have never made any such statement anywhere. I wish now to refer to a matter in connexion with the case of Mrs. Hart, who came here as a witness respecting her child which was alleged to have been killed by vaccination. I have seen the evidence given by Mrs. Hart, and also that given by Dr. Emms and Dr. Neale, and I thought it my duty as a member of the Barrow Board of Guardians to make some inquiry into the case of Mrs. Hart. In her evidence Mrs. Hart stated that her child was vaccinated in June; that was an error, she should have said in October. I have obtained the vaccination return



from the Vaccination Officer for the Barrow Union, in whose district Mrs. Hart resided, and he has given me a list of those children who were vaccinated at that date. In this list I find that Mrs. Hart's child was vaccinated on the 28th of October 1887, and not in June as Mrs. Hart first stated. I have also obtained the certificate of death of the child Hart, which I find is certified by Dr. Emms as dying of dropsy.

17,853. (*Chairman.*) We have had that certificate already?—I have also the certificate of death of a child named Pearson who was vaccinated at the same time as the child Hart. In this case the cause of death is certified by Dr. Emms as being convulsions. Dr. Emms stated before the Commission that an inquiry was ordered by the Barrow Board of Guardians into Hart's case of alleged injury from vaccination. At one of the meetings I attended I especially inquired as to whether any action had been taken in this matter by the Board; and I found that no inquiry at all had been ordered by the Board. The communications which were sent to the Board were simply laid upon the table after being read. At a meeting of the Barrow Board of Guardians, on the 6th of December 1887, the chairman said that "he had received a letter from the secretary of the Leicester and County Anti-vaccination League, enclosing a copy of a resolution passed by a public meeting held near the gaol, and trusting that the Board would give the subject referred to careful consideration in the interests of liberty. The resolution was: 'That letters be sent to the Barrow and Billesden Boards of Guardians, pointing out the fact that the child of Mr. and Mrs. Hart, of 22, Thurstaston Road, Belgrave, which died, was killed by vaccination, and to urge upon the said Boards of Guardians to stay their hands from further prosecution for non-compliance with the Vaccination Act.' That letter, said the chairman of the Board, was only a specimen of the wonderful amount of exaggeration and misrepresentation, which met them now on all sides. Of course they were not going into a discussion."

17,854. Is this worth our going into? We will investigate the case ourselves?—Do you accept it without further proof that no investigation was ordered by the Barrow Board?

17,855. If you know of your own knowledge you can tell us so; if you do not know of your own knowledge it will not appear more clearly by reading this?—I know of my own knowledge that no investigation was carried out by order of the Board of Guardians. After the reading of the letter the report of the proceedings states that it was decided, without discussion, that the letter should be taken no further notice of.

17,856. Is that on the minutes?—These remarks are not on the minutes of the Board.

17,857. Where do you get this from?—From a copy of the "Leicester Daily Mercury" for the 7th of December 1887 which gives a report of the proceedings of the Barrow Board of Guardians. There is no reference whatever to the case in the minutes of the Board for that date. At a subsequent meeting, on the 20th of December, 14 days afterwards, the case was again referred to and the only minute in the book is this: "The chairman read a letter he had received from Mr. J. Leavesley, chairman of the Leicester Board of Guardians, on the subject of vaccination, and also a letter from Dr. Emms on the same subject. The questions raised therein were not discussed."

17,858. Is there no reference to it in the minutes of the previous meeting?—No reference whatever in the minute recording the proceedings of the 6th December.

17,859. Have you examined the minutes?—Yes, I examined them, with the clerk of the Guardians for the purpose of obtaining these particulars for the Commission.

17,860. Do you know where the "Leicester Daily Mercury" got their information from?—The "Leicester Daily Mercury" got its information through the reporter who attended the meeting of the Board. The matter is not entered upon the minutes for the 6th of December at all, and no subsequent reference is made to it, according to the information given me by Mr. Scott, clerk to the Guardians, excepting the minute which I have read for the 20th December.

17,861. How do you know that the letter was ever sent to the Board of Guardians?—Here is the record in

a public newspaper of the chairman of the Board reading the letter.

17,862. Is it your experience that reports in public newspapers are always to be relied upon as accurate?—They are not always to be relied upon as accurate, but I should think no one would deny that the letter was read. If necessary we can produce the writer, and we can also call those to whom it was written. There is also the letter addressed to the chairman of the Board by Dr. Emms, which, I think, should be read.

17,863. Where is that from?—This is copied from the "Leicester Chronicle and Mercury" of the 24th of December 1887. These are copies of letters and they are important as affecting a case which has already been brought before the Commission. This letter of Dr. Emms which was addressed to the chairman of the Barrow Board of Guardians reads as follows:

"DEAR MR. BIRD,

"I was exceedingly sorry to see in the 'Daily Post' such a bitter attack on you by a Mr. Amos Booth. I would gladly answer him and the rest of the anti vaccination scribes had I honourable men to deal with, but I cannot condescend to take any notice of Messrs. Eilmore, Booth & Co., whose sole method of attack is by the publishing of the most unblushing falsehoods and the grossest abuse of anybody who attempts to differ from them. Your statement at the meeting of the Barrow Guardians is perfectly correct" (that is alluding to a statement made by the chairman at the previous meeting) "and the information was voluntarily offered to me by Mrs. Hart in my surgery, when unfortunately I allowed her to wheedle a certificate of death out of me instead of insisting on an inquest. As to the child Pearson, whom Mr. A. Booth has visited and found inflamed all over and paralysed in its legs, there is not a healthier child in the village at the present time, and the whole statement is one tissue of falsehoods from beginning to end, without the least shadow of foundation. Dr. Tomkins, the Medical Officer of Health for Leicester, was sent by 'somebody' to examine the dead body of Mrs. Hart's child, and also Mrs. Pearson's baby. He informed me that in his opinion the former died from dropsy, the result of nephritis, and not from blood poisoning or vaccination; and that Mrs. Pearson's child was perfectly healthy. No doubt, if applied to, he would corroborate my statement.

"Faithfully yours,

"A. WILSON EMMS."

The report goes on: "That was a perfect answer to the exaggerations and misrepresentations they had heard about that case, and he thought they need take no further notice of the matter. Mr. W. A. Stevenson, one of the Guardians for Belgrave" (this was the gentleman who visited Mrs. Hart) "said he had made it his business to see Mrs. Hart the other night, and she said several gentlemen called on her and her husband, and wrote a letter to her own mind, and asked Mr. Hart to sign it, which he did." Mr. Stevenson went on to say: "There was no doubt whatever that the child did not die from vaccination, but from inflammation of the kidneys and dropsy. He did not think it was fair that the anti-vaccinators should circulate statements which were not consistent with the case simply to answer their own ends. They all knew, of course, that men naturally made the most of their own case, but he thought they should be truthful. The matter then dropped." That visit of Mr. Stevenson to Mr. Hart was, I suppose, the reason for Dr. Emms stating that a deputation from the Barrow Board investigated the matter, but as a matter of fact no such investigation took place by order of Board.

17,864. You do not call that an investigation?—No, I do not call it an investigation. It was no official investigation ordered by the Board, but a private visit by Mr. Stevenson himself.

17,865. But I suppose that was the investigation Mr. Emms referred to?—Possibly so, but I thought it my duty to inquire into all these matters, and to mention them to the Commission.

17,866. (*Mr. Picton.*) You are fully acquainted with the whole of the organisation against compulsory vaccination, are you not?—Yes. I have been acquainted with the movement for more than twenty years.

17,867. Do you know if there are many people who make a profit by it?—I do not know any one who has

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made a profit by it; but on the other hand, I do know a great number of people who have sustained tremendous losses.

17,868. Of course we know you yourself have made great sacrifices, but there are agents employed upon some paid service, are there not?—Are your questions referring to the organisation in Leicester?

17,869. Generally.—So far as the organisation in Leicester is concerned there is no one paid for any service at all. The work is done entirely by voluntary effort.

17,870. There is no paid service at all?—There is no paid service at all.

17,871. Then every one who takes a part in it does it at the gratuitous sacrifice of his own time?—Yes; that is so at the sacrifice of both time and means. The only remuneration that has been given to my knowledge by the society was that connected with the appointment of an agent some years ago, who received a salary, but that agent was specially engaged by the society for only about two years.

The witness withdrew.

Mrs. M. A.  
Pearson.

Mrs. MARY ANN PEARSON examined.

17,876. (Chairman.) You are a silk-winder, living at No. 19, Thurcaston Road, Belgrave?—Yes.

17,877. Your child was vaccinated by Mr. Emms upon the 28th of October 1887?—Yes.

17,878. Is that the same time as Mrs. Hart's child?—Yes, it was vaccinated off the same shilling.

17,879. How did the child go on after vaccination?—After two or three days its feet and legs were drawn up and swollen very much; its legs became as if it were paralysed, and it never had the use of them.

17,880. How long after vaccination do you say that was?—Two or three days afterwards.

17,881. Was the child healthy before vaccination?—Yes.

17,882. How old was it?—It was five months old then.

17,883. Did the vaccination wounds heal up?—Yes, they got better.

17,884. And how did the child continue to be otherwise?—In a month or two afterwards he began to have fits, but he never had the use of his legs again, and he lived to be a year and seven months old.

17,885. Did Mr. Emms visit your child while it was ill?—Yes, he came when it was lying on the bed, and he said, "Where is this dying child?"

17,886. What more did he say?—He said, "It does not look much as if it was dying." I told him he was a little better that day.

17,887. That was referring to something which had been said, I suppose, about the child dying?—Yes.

17,888. Do you remember how long that was after vaccination?—I should think it was five or six weeks after.

17,889. Did you see Mrs. Hart's child at all?—Yes, I saw it twice after it was vaccinated, and I used to see it many times before; it was a very healthy child; I saw it twice afterwards. I saw the hole in its arm; the hole looked quite black.

17,890. Was the arm much swollen at the time?—Yes, I should think you might have put a sixpence in the hole.

17,891. Was the hole where the vaccination had been?—Yes.

17,892. The arm was very much swollen all round there, was it?—Yes, it was.

17,893. Did you notice anything else about the child?—She showed me all about it, and it looked as if it was full of sores all over it.

17,894. Did any other doctor, except Mr. Emms, see your child?—No.

17,895. You did not take it to the Infirmary at all?—No; Mrs. Hart took her child to the Infirmary.

17,896. (Mr. Hutchinson.) Your child's vaccination places healed well, did they not?—Yes.

17,897. For what reason do you attribute the paralysis of the legs to vaccination?—I don't know; it came

17,872. He is not employed now?—No, he is not employed now. His principal work was to assist me in organising the great national anti-compulsory vaccination demonstration which took place at Leicester in March 1885. Shortly afterwards he left our service.

17,873. Are you acquainted with the organisations elsewhere in the country?—Yes, I am acquainted with the organisation at several places in the country, and so far as I know, excepting a small commission paid for the collection of funds and annual subscriptions no one is paid at all, unless the secretary to the London and National Society receives a salary; and I suppose he would.

17,874. That is not within your knowledge?—I could not answer absolutely as to whether that is so or not. Even if he does it could not be called a "profit" as it would simply be payment for work performed.

17,875. (Dr. Collins.) I have not got the date of the death of the child Hart; could you give it me?—The child died on the 24th of November 1887.

like that after it was vaccinated; it was swollen very much, and the feet and legs were all drawn up.

17,898. The vaccination was doing well?—Yes.

17,899. No doctor, I suppose, led you to believe that the paralysis of the legs had anything to do with vaccination?—No, only that seemed to come after it.

17,900. (Sir Guyer Hunter.) What made you think this was the result of vaccination; did you form that impression yourself, or did anybody assist you to form it?—No, I do not think so, only it seemed so funny for it to come after vaccination, because it was such a strong and healthy child before.

17,901. Did anybody put the notion into your mind?—No.

17,902. What made you think so?—Because it came so afterwards.

17,903. That was the opinion you yourself formed; it was not an opinion that somebody else assisted you to form; it was your own idea?—Yes, it was.

17,904. (Dr. Collins.) Will you tell the Commission what day it was you saw the child of Mrs. Hart after vaccination?—I saw it two days before it died.

17,905. It died on the 24th of November, it would have been the 22nd of November when you saw it?—Yes.

17,906. It was taken to the Leicester Infirmary, was it not?—Yes, I think that was the day when she took it; it died directly after she got home.

17,907. You saw the child Hart when it was vaccinated along with your child?—Yes.

17,908. Did you see it any time between the day of vaccination and the time when you saw it before its death?—I saw it twice after it was vaccinated before it died.

17,909. Will you tell the Commission what was the first time after it was vaccinated that you saw the child?—It might be a week after.

17,910. Did you see its arm then?—Yes; it was getting very bad then, but not so bad as it was when I saw it the last time.

17,911. Have you had other children vaccinated besides the one you have told the Commission about?—No, that was the only one.

17,912. Have you seen many children who have been vaccinated?—No, I have not.

17,913. You have not had much experience of what vaccination looks like?—No.

17,914. Are you sure that on the 22nd of November, when you saw the child of Mrs. Hart, the arm had not healed up?—No, it was not; I could not say it was from the vaccinating, but there was a sore where it was vaccinated.

17,915. There was a sore place upon the arm where it was vaccinated?—Yes, where it was vaccinated, but whether it was from that or anything else I do not know.



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17,916. You told the Chairman that there were sores on other parts of its body?—Yes.

17,917. Did you see any redness upon any other part of the body?—Yes; it looked as if the skin was all off on the lower parts of its body.

17,918. Was it white or red as it should be?—It looked red and raw and very inflamed.

17,919. (Chairman.) Are you speaking of the body generally or of the arm in particular?—I think it was all from the arm; it seemed to come like that after the vaccination.

17,920. But when you say it looked inflamed, raw, and so on, are you speaking of the arm only or of other parts of the body?—Of other parts of the body as well.

17,921. (Dr. Collins.) Do you know whether any other children besides that one were vaccinated from that same child or at the same time as Mrs. Hart's child?—There was another child, in Abbey Lane, of the name of Hunt, that died, which was vaccinated off the same shilling, but Mrs. Hunt is dead since also.

17,922. Were there any others?—There was another child, whose mother is here now, but he was not vaccinated off the same shilling, but the same doctor vaccinated it the same day.

The witness withdrew.

Mrs. HANNAH TOLPUTT examined.

17,930. (Chairman.) Do you reside at 26, John Street, Belgrave?—Yes.

17,931. Was your child Ellen vaccinated by Mr. Emms upon the 28th October 1887?—Yes.

17,932. How old was she then?—Five months.

17,933. At that time, I believe, you lived in the same street as Mrs. Hart, and opposite where she lived?—Yes.

17,934. Was your child vaccinated at the same time as Mrs. Hart's child and Mrs. Pearson's child?—Yes.

17,935. You were all at the vaccination station together, were you?—Yes.

17,936. Was your child vaccinated with same lymph?—No, mine was vaccinated from a neighbour's child and theirs were vaccinated off a shilling.

17,937. Your child was vaccinated with lymph taken from a child who was there when you were there?—Yes.

17,938. How did your child go on after vaccination?—It was very ill; the arm began to swell in three or four days after it was done; we could not put its dress on for three or four weeks afterwards; it swelled right down from the time I took it to Dr. Emms.

17,939. Did the places heal where the vaccination had been done?—Yes, after about six weeks.

17,940. Did Mr. Emms attend your child?—Yes.

17,941. Did any other medical man see it?—No.

17,942. Did he give you medicine for it?—Yes, I had a bottle of green medicine given me, and he told me to poultice the arm with bread and milk.

17,943. Did he say anything about the vaccination?—He said it was a most horrible thing was vaccination; that he did not hold with it, but that he was bound to do it.

17,944. Did your husband call Mr. Ellmore's attention to the matter?—Yes.

17,945. Did he come to see your child?—Yes, and two other gentlemen.

17,946. Who were they?—Mr. Booth and Mr. Leavesley, I believe their names were.

17,947. Did you see Mrs. Hart's child?—Yes, I saw it every day after it was vaccinated till the time it died.

17,948. What was its appearance?—They made three places upon the arm, and there was only one took, and it went into a great hole; it appeared as if it went down to the bone.

17,949. You, of course, examined it, I suppose?—I only saw it as the mother had got it.

17,923. (Mr. Bright.) What do you mean by vaccinated off the same shilling?—The doctor got the matter off a shilling that he did their arms with.

(Chairman.) That has been already explained.

17,924. (Sir Edwin Galsworthy.) When you first noticed that the arms and legs of your child swelled, was the wound healed then or not?—No, it was very inflamed then; it was two or three days after vaccination.

17,925. (Mr. Picton.) What did you see in the sore arm of Mrs. Hart's child?—I only saw the hole in it.

17,926. Did you see that the first time you saw it?—It was not so bad the first time I saw it.

17,927. Did you notice the hole then?—No, not the first time; but it looked very inflamed and bad the first time.

17,928. Did you notice anything upon its hands?—Yes.

17,929. And was the arm swollen the first time you saw it much?—Yes, it was; it looked as if there were blisters coming out all over the child and on its feet; she stripped it, and I saw it all over; they looked like large blisters on it.

17,950. When you say it went down to the bone you mean it was very deep, I suppose?—Yes, it was very deep.

17,951. Was the arm very much swollen?—Yes, it was very much swollen.

17,952. Was the child swollen generally?—Yes, it began to swell directly.

17,953. Could you tell the Commission how soon after the vaccination you noticed that sore on Mrs. Hart's child's arm?—It would be about seven or eight days afterwards, I should say.

17,954. Did you see the hole in it then?—It was just before then; of course, it gradually got worse.

17,955. What was the last you saw of the child?—I saw it the day before it died.

17,956. Was the hole in its arm then?—Yes.

17,957. (Dr. Collins.) Have you watched the vaccinations of many children?—No, not a great many.

17,958. You know what a vaccinated arm looks like in the ordinary way?—Yes, I have had four of my own vaccinated.

17,959. Did the vaccination of the child Hart follow the course with which you are familiar in the vaccinations of your own children?—No, it did not look like vaccination at all.

17,960. In what way was it different?—It looked like one sore; it never came to a head at all as vaccination should do.

17,961. You saw it upon the 23rd of November, I think, the day before it died?—Yes.

17,962. Are you sure the arm then did not show a scar and not a sore place; which was it, a sore place or a scar?—A sore place, a deep hole in it.

17,963. (Chairman.) Was the arm very puffy and swollen round where this hole was?—Yes, it was swollen right down to its fingers; its fingers and toes and everything were swollen.

17,964. (Dr. Collins.) Was the arm redder or whiter than it should have been?—It was redder; it was very much inflamed.

17,965. Were all the limbs swollen?—Yes.

17,966. (Mr. Meadows White.) Were the eyes swollen?—Yes, they were swollen; you could scarcely see them, and the little hands had water blebs all over them.

17,967. (Dr. Collins.) Could you tell us where the swelling began if you watched the child from day to day?—At its arm.

17,968. (Mr. Meadows White.) Did you say you watched it from day to day?—I saw it from day to day, going in and out again.

The witness withdrew.

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H. Tolputt.



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MR. WILLIAM PALGRAVE ELLMORE examined.

17,969. (*Chairman.*) You reside at Belgrave Villa, Humberstone Road, Leicester?—Yes.

17,970. You are a willow grower and manufacturer and worker in bamboo?—Yes.

11,971. You are a member of the Barrow Board of Guardians?—Yes, I am.

17,972. Were you elected in 1887?—Yes.

17,973. You were formerly a believer in vaccination?—That is so.

17,974. When did you cease to be so?—After visiting a child of the name of Irwin.

17,975. When was that?—I think it would be a matter of about 10 years ago now. I have a statement here which I have committed to writing, and with your Lordship's permission I will read it. I used to believe in vaccination, but found that it was attended with great risks from seeing a child which was suffering from its effects. The name of the child was Irving; then living in East Bond Street, Leicester, and it had been suffering three or four years when I saw it. One of the most striking cases showing the appalling results of vaccination is that of Albert Irwin, son of Mrs. Irwin, 102, Crafton Street, Leicester. This youth is now 14 years old (on May 3rd last). He was five months old when vaccinated.

17,976. When did you first see the child?—I think when it was about three years of age.

17,977. Then it would be about 11 years ago?—Yes, about 11 years ago; I think it was between three and four years old when I saw the child.

17,978. From whom did you get the information about its then condition?—From its mother. The operation was performed by Dr. Pearce at the public vaccination station, York Street, Leicester, the lymph being taken from another child's arm. He was perfectly healthy before the operation which took place on the Wednesday, and on the Saturday following inflammation set in around the places and running up to the neck of the child and on the side of the head. The doctor ordered some magnesia. He did not take any matter from him. The places did not heal up for six months. For a few days the scales would dry up and then burst out again, and would run like water. Dr. Pearce attended to him and gave medicine and ointment free, but after a time directed Mrs. Irwin to go to her family doctor, who was Dr. Jacques, in The Newarks, Leicester. Dr. Jacques attended the child for some time without doing any good, after which he was placed under Dr. Sidley and Dr. Johnston with the same result, Mrs. Irwin then paid Dr. Shaw 21s. to see what he could do in the matter. He saw the child three times, after which he was nine weeks in the Infirmary under Dr. Crane, but as the child continued to be no better he was again placed under Dr. Jacques and Dr. Barclay. At last he was placed with Dr. Clark, London Road. The child at that time was a mass of running sores, and had turned three years old, so it would have been about three years and a month or two old when I saw this child. His illness is continuing yet, and his legs burst out with sores frequently. I saw the youth again a few weeks ago. The parents, both father and mother, are very healthy and the other children are all right. I saw other cases of injury. In November 1887 my attention was called to a child named Hart, whose parents were living at Belgrave. I visited Mr. Hart's house about November 10th and saw his child, and a more heartrending and pitiable sight it was never my lot to see. The child's body was swollen in every joint, and many parts were perfectly raw. I saw the vaccinated arm, which was considerably swollen and inflamed, and had a large open discharging sore. The child's eyes were swollen to such an extent that I doubt whether it was possible for it to see, and it was in one of the most distressing conditions that I could imagine a child to be in.

17,979. Did you assume that all the symptoms you saw were due to vaccination?—I had nothing else to guide me in the matter. I visited the child on subsequent occasions on November 13th, the 20th, and 21st, and again called the day following its burial. Nearly opposite to Mr. Hart's house lived a woman named Pearson, who also had a child that was vaccinated at the same time and place as Hart's. At the time I saw this child it was in anything but a healthy

condition. His fingers were contracted in such a manner that the mother was unable to straighten them, in which attempt it caused the child considerable pain as was evidenced by the outburst of crying. The feet and legs were considerably swollen, and the skin bright and glossy. The mother assured me that this had been the case in a more or less severe manner from within some few days after it was vaccinated. I saw the child on one or two subsequent occasions, and its condition appeared to be very much the same on each occasion. There was also another child named Poultney, which suffered considerably after vaccination, and Mr. Poultney came to me about it. When my eldest son, Ernest, was born in August 1878, I asked our medical man, the late Dr. Sidley, if he could guarantee immunity from such serious results as I had observed, or from small-pox itself, even if I were to have the child vaccinated. He replied that he would use every precaution in performing the operation and obtain the best lymph obtainable, but he could give no assurance that evil results should not follow. I therefore declined to have the child vaccinated, and I was summoned to answer for my neglect. I appeared in person before the magistrates on 28th April 1879, and took the child above referred to into court; that is the child Irwin. I drew the attention of the magistrates to the condition of this poor sufferer, and pleaded that the injuries it had received from vaccination were sufficient to justify me in refusing to allow my child to run the risk of similar sufferings. I also told the magistrates that three other children vaccinated at the same time, all suffered directly afterwards from evil results.

17,980. (*Mr. Meadows White.*) At the same time as Irwin?—Yes, at the same time as Irwin. My plea was disregarded, and I was fined 10s., including costs. The fine was paid. My second child, a girl named Maud, was born November 1879. I was summoned for neglecting to have her vaccinated and again appeared before the magistrates on 8th April 1881. I was again fined 10s. I refused to pay the fine as I felt it was a great injustice to have to pay a tax for having a healthy child which I desired to keep well. I was repeatedly visited at my residence by Police Sergeant Farmer, who tried to persuade me to pay the fine. He said that if he were sent to ticket my goods he would ticket the best oil painting I had in the house. I assured him that I should not pay the fine. As I was about to visit the continent for a few weeks I obtained a promise from the Sergeant that no steps should be taken to disturb the peace of my home while I was away. However, notwithstanding this assurance during the time I was away on the Continent almost every day this policeman in uniform visited my mother's home with the view of inducing her to pay the fine I had refused to pay. My mother became so ashamed of and disgusted at this conduct that she paid the man the amount to get rid of the intrusion and annoyance. I was summoned for another child named Tayton, born September 1885, on June 13th, 1888. At this time I was residing just beyond the borough boundary, I again appeared, and was fined 10s. and costs, in all 22s. As I refused to pay the fine a distraint warrant was issued against my goods. Three pieces of furniture were marked, originally costing forty guineas the suite. No auctioneer in the town or county could be induced to sell the goods, so the authorities finally brought one from Birmingham. There was a considerable gathering of townspeople at the sale who protested as emphatically as they could. My goods were bought in, but the fine and costs were increased to me to a total of between 4l. and 5l., besides what it cost the authorities to effect the sale. After the sale two public meetings were held in different parts of the town. Since that time another child has been born, but I have not been interfered with. This is accounted for by the fact the Guardians of the Barrow Union, of which I am a member, have decided to suspend prosecutions.

17,981. (*Mr. Picton.*) When you say the Board of Guardians have decided to suspend prosecutions, for how long have they decided to do so?—Not for any specific time, the resolution only applies to one year; it is an annual election of Guardians.

17,982. Has it any relation to the sittings of this Commission; in similar cases I have seen it stated that the Guardians have suspended prosecutions pending the report of this Commission, I want to know whether that applied to the Barrow Guardians?—It



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was not purely from the fact that there is a Commission sitting on the question.

17,983. (*Dr. Collins.*) You told the Commission that you first saw Mrs. Hart's child upon the 10th of November 1887, can you tell me how many times you saw the child after that date to the time of its death upon the 24th November?—I think, in all, five times.

17,984. It has been stated to the Commission that it is untrue to say that about seven days after vaccination she began to swell in every joint she had—her arms, knees, fingers, and every joint of the child's body—what do you say to that?—If it has been said that that statement was false it must have been by somebody who never saw the child, because I saw the child several times, and I most emphatically say that the child's body was swollen in every part; the skin had burst and was quite raw.

17,985. The question was put to the same witness: "It is stated by the mother that three places were made upon the child's arm, two of which did not take at all, and the one that did take went to a large black hole, large enough to drop a pea in." The answer to that is: "It is absurd; the vaccination had nothing whatever to do with the child's death; that you may take my word for?"—I most emphatically say that there was a very considerable hole in the child's arm, a very nasty, ulcerous-looking sore, and a discharging hole. I saw this hole on several occasions, perhaps two or three times.

17,986. The same witness was asked whether it was true to say that at that time she was ill, beginning to swell in her joints, and his reply was, "Those are all symptoms of blood poisoning. I say it is absolutely untrue." What do you say about that?—I scarcely follow you.

17,987. Are you able to tell the Commission of your own knowledge whether there was or was not a swelling of the joints of the child?—Yes, undoubtedly all the joints of the child's body were swollen.

17,988. What was the last date upon which you saw the child prior to its death?—I think the 21st of November.

17,989. That would be three days before its death?—Possibly it would. I do not know quite when the child died as to the date.

17,990. The Commission has been told that the child's arm presented a scar in the place of vaccination, and not a sore, what do you say to that?—It had a great hole in it large enough to lay a horse-bean in.

17,991. You told the Commission that it was a discharging sore?—I mean by that that it was an ulcerous-looking hole.

17,992. Are you able to say that was the state in which you saw it last prior to the child's death?—I do not recollect that there was any alteration in the condition of that sore on any of the occasions upon which I saw the child.

17,993. Have you seen many vaccinated arms?—Yes, I have seen a good few.

17,994. Are you able to tell the Commission whether the appearances in the case of the child Hart differed materially from the usual appearances of vaccinated arms?—There was a very marked difference; I have seen many, none of which presented the same appearance.

17,995. Will you tell the Commission how it differed from ordinary cases?—When I saw it it was considerably swollen, and had this ulcerous-looking open sore upon the arm; in that way it differed from the other children, which did not have the same condition of things to contend with.

17,996. Was the skin of the arm red?—No; I think it was decidedly of a whitish and glossy appearance as if there were water underneath.\*

17,997. Was there any swelling in other parts of the body?—Every joint of the child's body was swollen; at the back of the arm the skin had burst.

17,998. The swelling may have been in the skin over the joint, not in the joint itself, may it not; but perhaps that is too technical a question to trouble you with?—I am afraid it is too fine for me to answer; I know the joint was swollen, but whether it was the skin or the bone I could not say.

17,999. Would it be incorrect to say that the last time you saw the child's arm it was going on to form a scar?—Certainly it would.

18,000. Did you pay particular attention to the condition of the arm at the time you called?—Yes, I was much interested in the condition of the arm, and my statement is that it was an open ulcerous-looking sore.

18,001. (*Mr. Meadows White.*) When did you first see the child?—Upon the 10th of November.

18,002. (*Mr. Hutchinson.*) I understand you to say that you last saw the child a week before it died?—It was about a week.

18,003. And also, I understood you to say to Dr. Collins, that the sore was then about the size of a pea?—No, I said the sore was large enough to drop a horse bean into it.

18,004. (*Sir Charles Dalrymple.*) As to the case of this child, were you at any pains to make inquiries of the medical men who attended it as to what their opinion was of the case?—No.

18,005. Although you were informed that some four or five medical men were consulted?—I think only one doctor was associated with the child Hart.

18,006. There was the case of Irwin you mentioned, where the mother went from one doctor to another; did you make any inquiry of the medical men employed in that case?—I did not.

18,007. Were you not sufficiently interested in that case to get any other information about it except through the parent?—In my opinion that was as reliable a source as one could go to.

18,008. Upon a question of disease?—Upon the question of the evil results from vaccination.

18,009. You think the parent would be the best authority upon that subject as compared with a medical man?—If it was an intelligent parent I think I should place quite as much authority upon his statement as I should upon some medical men's statement, to wit, Dr. Emms, at any rate.

18,010. (*Sir William Savory.*) You are sure of all the facts to which you speak as to the condition of the child?—Yes, I saw it with my own eyes.

18,011. You are quite clear that the arm round the hole was white and pale?—I am not quite positive about that, but it seems to run in my mind that the flesh was whitish or creamy or of a silvery colour, in consequence of the watery condition and the swollen character of the limb.\*

18,012. It would be wrong, would it not, for anybody to describe it as red?—I would not be positive upon that statement.†

18,013. You would be positive as to the others?—Yes, I would be positive as to the hole in the arm.

18,014. You would know whether it was a healthy sore going on to heal or not?—Yes, I should know that.

18,015. (*Mr. Bright.*) Was the body of the child very whitish also?—Yes, the whole of it; it was in a most sad and deplorable condition to behold.

18,016. Was none of it red or inflamed looking?—By its being of this creamy condition of skin I should attribute it to considerable inflammation, but not to inflammation such as you see in a wound upon your hand or anything of that kind, which would often be very red, it did not strike me like that.

18,017. The history of this case has been often told in Leicester, I suppose?—Not latterly, I believe. At that time I was mixed up with letters to the public papers, but not since. I have been away in Australia, in fact.

18,018. You do not know whether there were any pains taken to verify the statements that were made?—I do not know about that.

\* Excepting at the joints which were raw and red.—W.P.E.

† Undoubtedly it was red at the joints as before stated.—W.P.E.

The witness withdrew.

Adjourned till Wednesday, 11th November, at 1 o'clock.



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APPENDIX I.

(Papers handed in by Professor Edgar March Crookshank, M.B., 9th, 23rd, and 30th July, 6th August, 12th, 19th and 26th November, and 3rd December 1890.)

THE MORTALITY FROM SMALL-POX IN THE COUNTRY IN THE LAST CENTURY.

(Haygarth, "Sketch of a plan to exterminate the casual small-pox in Great Britain," 1793.)

(See Question 10,749.)

*In Kent.*—Contrast the observations here accurately stated, in a district where inoculation is encouraged with others, in a different part of the kingdom where it is cautiously avoided. The Rev. Mr. Howlett, author of "Observations on the Population of England," the candid and intelligent opposer of the celebrated and ingenious Dr. Price, in a letter dated 1782, wrote the following remark:—"I have been 20 years curate of "two country parishes not six miles distant from this "town (Maidstone, in Kent); the first 12 years of "Boughton, and the last eight of Hunton Boughton "about a year ago, contained, as appears from an "accurate enumeration, 497 inhabitants; Hunton, 432. "During the 12 years in the former and eight in "the latter, the number of deaths by the small-pox "in both had not exceeded five. I believe that I might "affirm that there have not been above five deaths in "my native parish within the last 20 years, although "it now contains 624 people. Hence it appears "that among 1,088 inhabitants, taken in three country "parishes of Kent, only 10 persons have died of the "small-pox in 20 years, or that its annual fatality "has not exceeded one in 20,000."

*In Sussex.*—Mr. Counah, secretary of the infirmary, and formerly inspector of the Small-pox Society at

Chester, informs me that both the casual and inoculated distemper are carefully avoided in Sussex. He was a practical surgeon at Seaford in that county, and at my request made inquiry what proportion of the inhabitants had died of this pestilence. The town contains about 700 people. He was informed that about 11 years ago one person had died of the small-pox, but could not learn when a like misfortune happened in the place antecedent to that period. How far this wonderful exemption from the mortality of the distemper extends through the south of England I cannot determine. The facts here related in regard to both Kent and Sussex are taken by accident, and I have no reason to believe them extraordinary in these counties. But no fact, in any degree, similar to them can be produced in this neighbourhood, nor probably in any other where inoculation is freely allowed, and where, at the same time, the casual contagion is permitted to make its destructive progress without any kind of interruption. If the feeble, irregular, unconnected, and unauthorised efforts of individuals can prevent so much mischief, how much more benefit might reasonably be expected from the united, systematic, and concerted regulations of the whole island aided and strengthened by legal premiums and punishments.

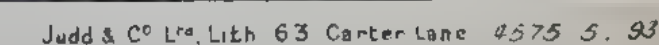
SMALL-POX INOCULATION: TWELVE CASES REPORTED BY BARON DIMSDALE SHOWING THE MINIMUM RESULT BY SMALL-POX INOCULATION CONSIDERED BY HIM SUFFICIENT TO AFFORD PROTECTION.

(Dimsdale, "The Recent Method of Inoculating for the Small-pox," 1779.)

(See Question 10,780.)

	Date of Inoculation.	State of Arms.	General Result.
CASE I.—Middle-aged man	November 23-	November 26th.—Appeared to be certainly infected and very forward. November 28th.—Much inflamed for a considerable space round the incision; an erysipelatous appearance extended between elbow and shoulder.	Flying pains in head and limbs, without the least degree of fever. Several eruptions on hips and one on the neck. Some of these matured, others died away; upon the whole the procedure was such as would not by any have been called variolous, if unattended with other circumstances.
CASE II.—A man	November 23-	November 28th.—Skin discoloured at incision; did not appear inflamed; no itching.	November 30th.—Re-inoculated. In evening chilliness, pains in head and limbs. Continued for two days, but without the least appearance of a fever. A very few pimples soon vanished without maturing.
CASE III.—A young man	November 23-	Arm not seen until 28th. He said incised part had itched; it now appeared nearly in same state as the preceding.	Re-inoculated. As in above case











*(Papers handed in by Professor Edgar March Crookshank, M.B.)*

App. No. 1.

	Date of Inoculation.	State of Arms.	General Result.
CASE IV.—A man	May 5th	Seen on May 11th. Arm had itched very much. Both incisions considerably inflamed. 12th.—Some pain in right shoulder.	Continued free from all complaints to 15th, the arms appearing as is usual when the distemper is attended with very few pustules, that is to say, not quite free from inflammation, but with a slight one
CASE V.—A man	May 3rd	On 7th appeared forward. On 8th inflamed appearance on incision abated from this time.	On 8th felt a general uneasiness attended with loss of appetite. Next day pretty well, and continued so without any other illness.
CASE VI.—A middle-aged man.	—	This "case in every circumstance so nearly resembled the former as to render it needless to enumerate the particulars." Both re-inoculated without any eruption or sign of infection.	
CASE VII.—A man	Dec. 5th	On 7th, arm itched very much, and showed certain marks of infection having succeeded. Inflammatory appearance considerably abated; incisions seemed disposed to heal; no uneasiness on the part.	On 12th and 13th.—Complained of pains in his head and limbs, stiffness under arms; no alteration in the pulse, nor any other sign of fever; a few pimples about the neck and arms followed these complaints, yet not such as are esteemed variolous on any other occasion. Inoculated again without least effect.
CASE VIII.—A man	—	Morning of third day showed uncommon signs of infection; much inflamed; incision had itched several times. 6th and 7th.—Altered their colour to darker hue; inflammation and hardness abating. 8th.—Rather more inflamed; soon quite well.	Second day from inoculation; head giddy and painful; some chilly fits. 8th.—From this time all complaints of every kind ceased. Returned home on 13th from the inoculation without having a single eruption of any kind.
CASE IX.—A youth	June 2nd	Incised parts felt uneasy and itched. Arm appeared infected; very forward. On 7th, inflammation considerably abated; incision seemed disposed to heal.	Next day in bed; pains in head. On 8th cold considerably better. Re-inoculated; no marks of infection.
CASE X.—A young man	December 19th	Disagreeable numbness and stiffness in same day at one incision. 22nd.—Pulse quickened; no fever.	Some headache, said to have. 22nd.—Several pimples. In afternoon several pustules out. All complaints gave off, seemed quite well.
CASE XI.—Two men	—	On third day, places of insertion very much inflamed, itching, and uneasiness. On sixth day, inflammation on arm of one considerably abated; incisions of the other still in inflamed state.	One had chilly fits, the other felt hot and itched, but said he was very well. On sixth day one free from any complaint, the other very chilly, but no the least appearance of fever. He was re-inoculated without the least signs of infection.
CASE XII.—A gentlewoman	—	Inoculated parts, and more especially one arm, smarted very much. Much inflamed and a little elevated. On third morning, flushing on the skin round the puncture nearly the breadth of a sixpence; on applying finger, feels hard about the middle. On sixth day, inflammation on arm began to turn to a yellowish brown, and every inflammatory appearance wore off.	Head ached for several evenings. No increase of heat or alteration in the pulse.  On sixth day she remained perfectly well.



THE SUPPRESSION OR "STAMPING OUT" OR THE PLAGUE: EXTRACTS FROM "A DISCOURSE ON THE PLAGUE"  
BY DR. RICHARD MEAD.

(From Volume II. of "The Medical Works of Dr. Richard Mead," Edinburgh, 1765.)

(See Question 10,996.)

(Dedication.)

To the Right Honourable James Craggs, Esquire ; one  
of His Majesty's Principal Secretaries of State.

SIR,

I most humbly offer to you my thoughts concerning the prevention of the plague, which I have put together by your command. As soon as you were pleased to signify to me, in His Majesty's absence, that their Excellencies the Lords Justices thought it necessary for the public safety, upon the account of the sickness now in France, that proper directions should be drawn up to defend ourselves from such a calamity ; I most readily undertook the task, though upon short warning, and with little leisure : I have therefore rather put down the principal heads of caution, than a set of directions in form.

The first, which relate to the performing quarantines, &c., you, who are perfectly versed in the history of Europe, will see are agreeable to what is practised in other countries, with some new regulations. The next, concerning the suppressing infection here, are very different from the methods taken in former times among us, and from what they commonly do abroad ; but, I persuade myself, will be found agreeable to reason.

I most heartily wish, that the wise measures the Government has already taken, and will continue to take, with regard to the former of these, may make the rules about the latter unnecessary. However, it is fit, we should be always provided with proper means of defence against so terrible an enemy.

May this short essay be received as one instance, among many others, of the care you always show for your country ; and as a testimony of the great esteem and respect, with which I have the honour to be,

Sir,

Your most obedient, and  
Most humble Servant,  
R. MEAD.

Nov. 25, 1720.

(Part II. "Of the Methods to be taken against the  
"Plague.")

(Chapter I.)

*Of preventing infection from other countries.*

As it is a satisfaction to know, that the plague is not a native of our country, so this is likewise an encouragement to the utmost diligence in finding out means to keep ourselves clear from it.

This caution consists of two parts : The preventing its being brought into our island ; and, if such a calamity should happen, the putting a stop to its spreading among us.

The first of these is provided for by the established method of obliging ships that come from infected places, to perform quarantine : as to which, I think it necessary, that the following rules be observed.

Near to our several ports, there should be lazarettoes built in convenient places, on little islands, if it can so be, for the reception both of men and goods, which arrive from places suspected of infection : the keeping men in quarantine on board the ship being not sufficient ; the only use of which is to observe whether any die among them. For infection may be preserved so long in cloaths, in which it is once lodged, that as much, nay more of it, if sickness continues in the ship, may be brought on shore at the end than at the beginning of forty days : unless a new quarantine be begun every time any person dies ; which might not end but with the destruction of the whole ship's crew.

If there has been any contagious distemper in the ship ; the sound men should leave their cloaths, which should be sunk in the sea, the men washed and shaved, and having fresh cloaths, should stay in the lazaretto 30 or 40 days. The reason of this is, because persons may be recovered from a disease themselves, and yet retain matter of infection about them a considerable time : as we frequently see the small pox taken from those who have several days before passed through the distemper.

The sick, if there be any, should be kept in houses remote from the sound, and, some time after they are well, should also be washed and shaved, and have fresh cloaths ; whatever they wore while sick being sunk or buried : and then being removed to the houses of the sound, should continue there 30 or 40 days.

I am particularly careful to destroy the cloaths of the sick, because they harbour the very quintessence of contagion. A very ingenious author,\* in his admirable description of the plague at Florence in the year 1348, relates what himself saw : That two hogs finding in the streets the rags which had been thrown out from off a poor man dead of the disease, after snuffing upon them, and tearing them with their teeth, they fell into convulsions, and died in less than an hour. The learned Fracastorius acquaints us, that in his time, there being a plague in Verona, no less than 25 persons were successively killed by the infection of one fur garment.† And Forestus gives a like instance of seven children, who died by playing upon cloaths brought to Alekmaer in North Holland from an infected house in Zealand.‡ The late Mr. Williams, chaplain to Sir Robert Sutton, when Ambassador at Constantinople, used to relate a story of the same nature told him by a bassa : That in an expedition this bassa made to the frontiers of Poland, one of the janissaries under his command died of the plague ; whose jacket, a very rich one, being bought by another janissary, it was no sooner put on, but he also was taken sick, and died : and the same misfortune befel five janissaries more who afterwards wore it. This the bassa related to Mr. Williams, chiefly for the sake of this further circumstance, that the incidents now mentioned prevailed upon him to order the burning of the garment : designing by this instance to let Mr. Williams see there were Turks who allowed themselves in so much freedom of thought as not to pay that strict regard to the Mahometan doctrine of fatality, as the vulgar among them do.

If there has been no sickness in the ship, I see no reason why the men should perform quarantine. Instead of this, they may be washed, and their cloaths aired in the lazaretto, as goods, for one week.

But the greatest danger is from such goods as are apt to retain infection, such as cotton, hemp, and flax, paper or books, silk of all sorts, linen, wool, feathers, hair, and all kinds of skins. The lazaretto for these should be at a distance from that for the men ; and they must in convenient warehouses be unpacked, and exposed, as much as may be, to the fresh air for 40 days.

This may perhaps seem too long ; but as we do not know how much time precisely is necessary to purge the interstices of spongy substances from infectious matter by fresh air, the caution cannot be too great in this point. Certainly the time here proposed, having been long established by general custom, ought not in the least to be retrenched ; unless there could be a way found out of trying when bodies have ceased to emit the noxious fumes. Possibly this might be discovered by putting tender animals near to them, particularly little birds : because it has been observed, in times of the plague, that the country has been forsaken by the birds ;

\* Boccaccio Decameron. giornat. prim.

† De contagione, l. iii. c. 7.

‡ Observat. l. vi. schol. ad observ. 22.



(Papers handed in by Professor Edgar March Crookshank, M.B.)

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and those kept in houses have many of them died.\* Now, if it should be found, that birds let loose among goods at the beginning of their quarantine, are obnoxious to the contagion in them, it may be known, in good measure, when such goods are become clean, by repeating the trial till birds let fly among them receive no hurt. But the use of this expedient can be known only by experience. In the mean time, I own I am fond of the thought, in compassion to poor labourers, who must expose their lives to danger, in the attendance upon this work: and though I am well aware that there are plagues among animals, which do not indifferently affect all kinds of them, some being confined to a particular species, (like the disease of the black cattle here, a few years since, which neither proved infectious to other brutes, nor to men); yet it has always been observed that the true plague among men has been destructive to all creatures of what kind so ever.

A very remarkable story, lately communicated to me by a person of undoubted credit, is too much to the purpose to be here omitted. The fact is this. In the year 1726, an English ship took in goods at Grand Cairo, in the time of the plagues<sup>†</sup> raging there, and carried them to Alexandria. Upon opening one of the bales of wool in a field, two Turks employed in the work were immediately killed; and some birds, which happened to fly over the place, dropped down dead.

However, the use of quarantines is not wholly frustrated by our ignorance of the exact time required for this purification; since the quarantine does at least serve as a trial whether goods are infected or not; it being hardly possible that every one of those who are obliged to attend upon them, can escape hurt if they are so. And, whenever that happens, the goods must be destroyed.

I take it for granted, that the goods should be opened, when they are put into the lazaretto, otherwise their being there will avail nothing. This is the constant practice in the ports of Italy. That it is so at Leghorn, appears by the account lately published of the manner in which quarantines are there performed: and I find, that the same rule is observed at Venice, from an authentic paper I have before me, containing the methods made use of in that city, where quarantines have been enjoined ever since the year 1484; at which time, as far as I can learn, they were first instituted in Europe. In that place all bales of cotton, of camel's or of beaver's hair, and the like, are ript open from end to end, and holes made in them by the porters every day, into which they thrust their naked arms, in order that the air may have free access to every part of the goods. That some such cautions as these ought not to be omitted, is clearly proved by the misfortune which happened in the Island of Bermudas about the year 1695; where, as the account was given me by the learned Dr. Halley, a sack of cotton put on shore by stealth, lay above a month without any prejudice to the people of the house where it was hid: but when it came to be distributed among the inhabitants, it carried such a contagion along with it, that the living scarce sufficed to bury the dead. This relation Dr. Halley received from Captain Tucker of Bermudas, brother to Mr. Tucker, late under secretary in our secretary's office.

Indeed, as it has been frequently experienced, that of all the goods which harbour infection, cotton in particular is the most dangerous, and Turkey is almost a perpetual seminary of the plague; I cannot but think it highly reasonable, that whatever cotton is imported from that part of the world, should at all times be kept in quarantine; because it may have imbibed infection at the time of its packing up, notwithstanding no mischief has been felt from it by the ship's company. And the length of time from its being packed up to its arrival here, is no certain security that it is cleared from the infection. At least, it is found, that the time employed by ships in passing between Turkey and Marseilles, is not long enough for goods to lose their infection: as appears not only from the late instance, but also from an observation made in a certain memorial drawn up by the deputy of trade at Marseilles.<sup>†</sup> Marseilles is the only port in France allowed to receive goods from the Levant, on account of its singular convenience for quarantines, by reason of several small islands situate about it. The ports of France in the western ocean having had a desire to be allowed the same liberty, their deputies presented,

in the year 1701, a memorial to the Royal Council of Trade, containing several reasons for their pretensions. To this the deputy at Marseilles makes reply in the memorial I am speaking of, in which this advantage of Marseilles for quarantines above the other ports, is much insisted upon; and, to evince the importance thereof, it is declared in express words, that many times persons have been found in that place to die of the plague in their attendance upon goods under quarantine. Now, if it be certain, that goods have retained infection during their passage from Turkey to Marseilles; it is too hardy a presumption to be admitted in an affair so important as this, that they must necessarily lose all contagion in the time of their coming to us, because the voyage is something longer. But, besides this, there are some few instances of goods, that have retained their infection many years. In particular, Alex. Benedictus gives a very distinct relation of a feather-bed, that was laid by seven years on suspicion of its being infected, which produced mischievous effects at the end of that great length of time.\* And Sir Theodore Mayerne relates, that some cloaths fouled with blood and matter from plague-sores being lodged between matting and the wall of a house in Paris, gave the plague several years after to a workman, who took them out, which presently spread through the city.<sup>†</sup>

What makes cotton so eminently dangerous, is its great aptitude to imbibe and retain any sort of effluvia near it; of which I have formerly made a particular experiment, by causing some cotton to be placed for one day near a piece of putrefying flesh from an amputated limb, in a bell glass, but without touching it; for the cotton imbibed so strong a taint, that being put up in a close box, it retained its offensive scent above 10 months, and would, I believe, have kept it for years. If, instead of the fumes of putrefied flesh from a sound body, this cotton had been thus impregnated with the fumes of corrupted matter from one sick of the plague; I make no doubt but it would have communicated infection. And the experiment would have succeeded alike in both cases, if instead of cotton, silk, wool, or hair had been inclosed in the vessel; animal substances being the most apt to attract the volatile particles, which come from bodies of the same nature with themselves.

As all reasonable provisions should be made both for the sound and sick, who perform quarantine; so the strict keeping of it ought to be enforced by the severest penalties. And if a ship comes from any place, where the plague raged, at the time of the ship's departure from it, with more than usual violence; it will be the securest method to sink all the goods, and even the ship sometimes; especially if any on board have died of the disease.

Nor ought this further caution to be omitted, that when the contagion has ceased in any place by the approach of winter, it will not be safe to open a free trade with it too soon; because there are instances of the distempers being stopt by the winter-cold, and yet the seeds of it not destroyed, but only kept unactive, till the warmth of the following spring has given them new life and force. Thus in the great plague at Genoa about four score years ago, which continued part of two years, the first summer about 10,000 died, the winter following hardly any; but the summer after no less than 60,000. Likewise the last plague at London appeared the latter end of the year 1664, and was stopt during the winter by a hard frost of near three months' continuance; so that there remained no farther appearance of it till the ensuing spring.<sup>‡</sup> Now, if goods brought from such a place should retain any of the latent contagion, there will be danger of their producing the same mischief in the place to which they are brought as they would have caused in that from whence they came.

But, above all, it is necessary, that the clandestine importing of goods be punished with the utmost rigour; from which wicked practice I should always apprehend more danger of bringing the disease, than by any other way whatsoever.

These are, I think, the most material points, to which regard is to be had in defending ourselves against contagion from other countries. The particular manner of putting these directions in execution, as the visiting of ships, regulation of lazarettoes, &c., I leave to proper officers, who ought sometimes to be assisted herein by able physicians.

\* Alex. Benedict. de peste, cap. 3.

† In a paper of advice against the Plague, laid before the king and council by Sir Theod. Mayerne, in the year 1631, MS.

‡ Hodges de peste.

\* Diemerbroeck de peste, l. i. c. 4.

† Memorials presented by the deputies of the council of trade, in France, to the royal council, pages 44 and 45.



(Papers handed in by Professor Edgar March Crookshank, M.B.)

## (Chapter II.)

*Of stopping the progress of the plague, if it should enter our country.*

The next consideration is, what to do in case, through a miscarriage in the public care, by the neglect of officers, or otherwise, such a calamity should be suffered to befall us.

There is no evil in the world, in which the great rule of resisting the beginning, more properly takes place than in the present case ; and yet it has unfortunately happened, that the common steps formerly taken have had a direct tendency to hinder the putting this maxim in practice.

As the plague always breaks out in some particular place, it is certain, that the directions of the civil magistrate ought to be such, as to make it as much for the interest of infected families to discover their misfortune, as it is, when a house is on fire, to call in the assistance of the neighbourhood : whereas, on the contrary, the methods taken by the public, on such occasions, have always had the appearance of a severe discipline, and even punishment, rather than of a compassionate care ; which must naturally make the infected conceal the disease as long as was possible.

The main import of the orders issued out at these times was\* ; As soon as it was found, that any house was infected, to keep it shut up, with a large red cross, and these words, *Lord, have mercy upon us*, painted on the door ; watchmen attending day and night to prevent anyone's going in or out, except such physicians, surgeons, apothecaries, nurses, searchers, &c. as were allowed by authority ; and this to continue at least a month after all the family was dead or recovered.

It is not easy to conceive a more dismal scene of misery than this : families locked up from all their acquaintance, though seized with a distemper which the most of any in the world requires comfort and assistance ; abandoned it may be to the treatment of an inhumane nurse (for such are often found at these times about the sick) ; and strangers to everything but the melancholy fight of the progress death makes among themselves ; with small hopes of life left to the survivors, and those mixed with anxiety and doubt, whether it be not better to die, than to prolong a miserable being, after the loss of their best friends and nearest relations.

If fear, despair, and all dejection of spirits, dispose the body to receive contagion, and give it a great power, where it is received, as all physicians agree they do ; I do not see how a disease can be more enforced than by such a treatment.

Nothing can justify such cruelty, but the plea, that it is for the good of the whole community, and prevents the spreading of infection. But this upon due consideration will be found quite otherwise : for while contagion is kept nursed up in a house, and continually increased by the daily conquests it makes, it is impossible but the air should become tainted in so eminent a degree, as to spread the infection into the neighbourhood upon the first outlet. The shutting up houses in this manner is only keeping so many seminaries of contagion, sooner or later to be dispersed abroad : for the waiting a month, or longer, from the death of the last patient, will avail no more than keeping a bale of infected goods unpacked ; the poison will fly out, whenever the Pandora's box is opened.

As these measures were owing to the ignorance of the true nature of contagion, so they did, I firmly believe, contribute very much to the long continuance of the plague, every time they have been practised in this city ; and, no doubt, they have had as ill effects in other countries.

It is therefore no wonder, that grievous complaints were often made against this unreasonable usage ; and that the citizens were all along under the greatest apprehensions of being thus shut up. This occasioned their concealing the disease as long as they could, which contributed very much to the enforcing and spreading of it : and when they were confined, it often happened that they broke out of their imprisonment, either by getting out at windows, &c., or by bribing the watchman at their doors ; and sometimes even by murdering them. Hence in the nights, people were often met running about the streets, with hideous shrieks of horror

and despair, quite distracted, either from the violence of the fever, or from the terrors of mind, into which they were thrown by the daily deaths they saw of their nearest relations.

In these miserable circumstances, many ran away ; and when they had escaped, either went to their friends in the country ; or built huts or tents for themselves in the open fields, or got on board ships lying in the river. A few also were saved by keeping their houses close from all communication with their neighbours.\*

And it must be observed, that whenever popular clamours prevailed so far, as to procure some release for the sick, this was remarkably followed with an abatement of the disease. The plague, in the year 1636, began with great violence ; but leave being given by the king's authority for people to quit their houses, it was observed, that not one in 20 of the well persons removed fell sick, nor one in 10 of the sick died.† Which single instance alone, had there been no other, should have been of weight ever after to have determined the magistracy against too strict confinements. But besides this, a preceding plague, viz., in the year 1625, affords us another instance of a very remarkable decrease upon the discontinuing to shut up houses. It was indeed so late in the year before this was done, that the near approach of winter was doubtless one reason for the diminution of the disease which followed : yet this was so very great, that it is at least past dispute, that the liberty then permitted was no impediment to it. For this opening of the houses was allowed of in the beginning of September : and whereas the last week in August, there died no less than 4,218, the very next week the burials were diminished to 3,344 ; and in no longer time than to the fourth week after, to 852.‡

Since therefore the management in former times neither answers the purpose of discovering the beginning of the infection, nor of putting a stop to it when discovered, other measures are certainly to be taken ; which, I think, should be of this nature.

There ought, in the first place, a council of health to be established, consisting of some of the principal officers of state, both ecclesiastical and civil, some of the chief magistrates of the city, two or three physicians, &c. And this council should be entrusted with such powers, as might enable them to see all their orders executed with impartial justice, and that no unnecessary hardships, under any pretence whatever, be put upon any by the officers they employ.

Instead of ignorant old women, who are generally appointed searchers in parishes to enquire what diseases people die of, that office should be committed to understanding and diligent men : whose business it should be, as soon as they find any have died after an uncommon manner, particularly with livid spots, bubo's, or carbuncles, to give notice thereof to the council of health ; who should immediately send skilful physicians to examine the suspected bodies, and to visit the houses in the neighbourhood, especially of the poorer sort, among whom this evil generally begins. And if upon their report it appears, that a pestilential distemper is broken out, they should without delay order all the families in which the sickness is, to be removed ; the sick to different places from the sound : but the houses for both should be three or four miles out of town ; and the sound people should be stripped of all their cloaths, and washed and shaved, before they go into their new lodgings. These removals ought to be made in the night, when the streets are clear of people : which will prevent all danger of spreading the infection. And besides, all possible care should be taken to provide such means of conveyance for the sick, that they may receive no injury.

As this management is necessary with respect to the poor and meaner sort of people ; so the rich, who have conveniences, may, instead of being carried to lazarettes, be obliged to go to their country houses ; provided that care be always taken to keep the sound separated from the infected. And at the same time all the inhabitants who are yet well, should be permitted, nay encouraged to leave the town, which the thinner it is, will be the more healthy.

No manner of compassion and care should be wanting to the diseased ; to whom, when lodged in clean and airy habitations, there would, with due cautions, be no great danger in giving attendance. All expenses should be

\* Vid. Directions for the cure of the plague, by the College of Physicians and orders by the lord mayor and aldermen of London, published 1665.

\* Vid. A journal of the plague in 1665, by a citizen. London, 1722.

† Discourse upon the air, by Thos. Cock.

‡ Vid. The shutting up houses soberly debated, anno 1665.



(Papers handed in by Professor Edgar March Crookshank, M.B.)

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paid by the public, and no charges ought to be thought great, which are counter-balanced with the saving a nation from the greatest of calamities. Nor does it seem to me at all unreasonable, that a reward should be given to the person that makes the first discovery of infection in any place; since it is undeniable, that the making known the evil to those who are provided with proper methods against it, is the first and main step towards the overcoming it.

Although the methods taken in other countries, as well as in our own, have generally been different from what we have here recommended; yet there are not wanting some instances of extraordinary success attending these measures, whenever they happen to put in practice.

The magistrates of the city of Ferrara in Italy, in the year 1630, when all the country round about them was infected with the plague, observing the ill-success of the conduct of their neighbours, who, for fear of losing their commerce, did all they could to conceal the disease, by keeping the sick in their houses, resolved, whenever occasion should require, to take a different method. Accordingly, as soon as they received information, that one had died in their city of the pestilence, they immediately removed the whole family he belonged to into a lazaretto, where all, being seven in number, likewise died. But though the disease was thus malignant, it went no further, being suppressed at once by this method. Within the space of a year the same case returned seven or eight times, and this management as often put a stop to it. The example of this city was afterwards followed more than once by some other towns in the same territory, with so good success, that it was thought expedient, for the common good, to publish, in the memoirs of the people of Ferrara, this declaration: That the only remedy against the plague is to make the most early discovery of it, that is possible, and thus to extinguish it in the very beginning.\*

No less remarkable than this occurrence at Ferrara, is what happened at Rome in the plague I have taken notice of before, in the year 1657. When the disease had spread itself among both rich and poor, and raged in the most violent manner; the Pope appointed Cardinal Gastaldi, to be Commissary-General of Health, giving him for a time the power of the whole sacred college, with full commission to do whatever he should judge necessary. Hereupon he gave strict orders, that no sick or suspected person should stay in their own houses. These he removed, upon the first notice, to a lazaretto in the island of the Tiber; and all who were in the same houses with them to other hospitals just without the city, in order to be sent to the island, if they should fall sick, at the same time he took diligent care to send away their goods to an airy place to be cleansed. He executed these regulations with so much strictness, that no persons of the highest quality were exempted from this treatment; which occasioned at first great complaints against the Cardinal for his severity; but soon after he had general thanks: for in two months time, by this means, he entirely cleared the city of the pestilence, which had continued in it almost two years. And it was particularly observed, that whereas before, when once the disease had got into a house, it seldom ended without seizing the whole family; in this management scarce five out of an hundred of the sound persons removed were infected.†

I cannot but take notice, that the plague was stopped at Marseilles a full fortnight by the same measures, and probably might have been wholly extinguished, had not new force been given it by the unseasonable confidence of the inhabitants upon this intermission: which, we are informed, was so great, that they would not believe the pestilence had been at all among them, and publicly upbraided the physicians and surgeons for frightening them causelessly.‡ At this time, no doubt, they must have neglected the cautions necessary for their security so much, as to leave us no room to be surprised, that the disease should after this break out again with too great violence to be a second time overcome.

But, besides these examples in foreign countries, we have one instance of the same nature nearer home. When the plague was last here in England, upon its first entrance into Poole in Dorsetshire, the magistrates immediately suppressed it, by removing the sick into pest-houses, without the town, as is well remembered

there to this time. A very remarkable occurrence has greatly contributed towards preserving all the circumstances of this transaction in memory. They found some difficulty in procuring anyone to attend upon the sick after their removal: which obliged the town to engage a young woman, then under sentence of death, in that service, on a promise to use their interest for obtaining her pardon. The young woman escaped the disease, but neglecting to solicit the corporation for the accomplishment of their engagement with her, three or four months after she was barbarously hanged by the mayor upon a quarrel between them. I would have it observed, that as the advice I have been giving is founded upon this principle, that the best method for stopping infection, is to separate the healthy from the diseased; so in small towns and villages, where it is practicable, if the sound remove themselves into barracks, or the airy habitations, it may probably be even more useful, than to remove the sick. This method has been found beneficial in France after all others have failed. But the success of this proves the method of removing the sick, where this other cannot be practised, to be the most proper of any.

When the sick families are gone, all the goods of the houses in which they were, should be buried deep under the ground. This I prefer to burning them: because, especially in a close place, some infectious particles may possibly be dispersed by the smoke through the neighbourhood; according to what Mercurialis relates, that the plague in Venice was augmented by burning a large quantity of infected goods in the city.\* A learned physician of my acquaintance lately communicated to me the relation of a case, (given to him by an apothecary, who was at the place when the thing happened), very proper to be here mentioned. The story is this. At Shipston, a little town upon the River Stour in Worcestershire, a poor vagabond was seen walking in the streets with the small-pox upon him. The people, frightened, took care to have him carried to a little house, seated upon a hill, at some distance from the town, providing him with necessaries. In a few days the man died. They ordered him to be buried deep in the ground, and the house with his clothes to be burnt. The wind being pretty high, blew the smoke upon the houses on one side of the town: in that part, a few days after, eight persons were seized with the small-pox. So dangerous is heat in all kinds of pestilential distempers, and so diffusive of contagion. And moreover, the houses themselves may likewise be demolished or pulled down, if that can conveniently be done, that is, if they are remote enough from others: otherwise it may suffice to have them thoroughly cleansed, and then plastered up. And after this, all possible care ought still to be taken to remove whatever causes are found to breed and promote contagion. In order to do this, the overseers of the poor (who might be assisted herein by other officers) should visit the dwellings of all the meaner sort of the inhabitants; and where they find them stifled up too close and nasty, should lessen their number by sending some into better lodgings, and should take care, by all manner of provisions and encouragement, to make them more cleanly and sweet.

No good work carries its own reward with it so much as this kind of charity: and therefore, be the expense what it will, it must never be thought unreasonable. For nothing approaches so near to the first original of the plague, as air pent up, loaded with damps, and corrupted with the filthiness that proceeds from animal bodies.

Our common prisons afford us an instance of something like this, where very few escape what they call the gaol-fever, which is always attended with a degree of malignity in proportion to the closeness and stench of the place: and it would certainly very well become the wisdom of the Government, as well with regard to the health of the town, as in compassion to the prisoners, to take care, that all houses of confinement should be kept as airy and clean, as is consistent with the use to which they are designed.

The black assize at Oxford, held in the castle there in the year 1577, will never be forgot†; at which the judges, gentry, and almost all that were present, to the number of 300, were killed by a poisonous steam, thought by some to have broken forth from the earth; but a noble and great philosopher‡ more justly sup-

\* Muratori governo della peste, lib. i. c. 5.

† Cardin. Gastaldi de avvertenda peste, c. 10.

‡ Journal de ce qui s'est passé à Marseilles, &c. p. 9. 10. 11.

\* De pestilent. cap. 21.

† Camden. annal. Regin. Elizab.

‡ Lord Verulam, natural history, cent. 10. num. 194.



posed to have been brought by the prisoners out of the gaol into court; it being observed, that they alone were not injured by it.

At the same time that this care is taken of houses, the proper officers should be strictly charged to see that the streets be washed and kept clean from filth, carrion, and all manner of nuisances; which should be carried away in the night time: nor should the laystalls be suffered to be too near the city. Beggars and idle persons should be taken up, and such miserable objects as are neither fit for the common hospitals nor workhouses, should be provided for in an hospital of incurables.

Orders indeed of this kind are necessary to be observed at all times, especially in populous cities; and therefore I am sorry to take notice, that in these of London and Westminster there is no good police established in these respects: for want of which the citizens and gentry are every day annoyed more ways than one.

If these early precautions we have mentioned, prove successful, there will be no need of any methods for correcting the air, purifying houses, or of rules for preserving particular persons from infection: to all which, if the plague get head, so that the sick are too many to be removed, (as they will be when the disease has raged for a considerable time), regard must be had.

As to the first, fire has been almost universally recommended for this purpose, both by the ancients and moderns, who have advised to make frequent and numerous fires in the town infected. This precept, I think, is almost entirely founded upon a tradition, that Hippocrates put a stop to a plague in Greece by this means. But it is to be observed that, there is no mention made of anything like it in the works of Hippocrates. The best authority we have for it, is the testimony of Galen, though it is also mentioned by other authors. Galen, recommending Theriaca against the pestilence, has thought fit, it seems, to compare it to fire; and, upon this conceit, relates, that Hippocrates cured a plague which came from Æthiopia into Greece by purifying the air with fires; into which were thrown sweet-scented herbs and flowers, together with ointments of the finest flavour. It is remarkable, that among the epistles ascribed to Hippocrates, which, though not genuine, yet are older than Galen, there is a decree said to be made by the Athenians in honour of this father of physicians, which, making mention of the service he had done his country in a plague, says only, that he sent his scholars into several parts, with proper instructions to cure the disease. By which it should seem that this story of the fires was hardly or not at all known at the time when these letters were compiled. And Soranus may yet more confirm us, that it was framed long after the death of Hippocrates: for Soranus only says in general, that Hippocrates foretold the coming of the pestilence, and took care of the cities of Greece; without any mention of having used this particular expedient. Plutarch indeed speaks of a practice like this as commonly approved among physicians, which he makes use of to illustrate a certain custom of the Egyptians: of whom he says, that they purify the air by the fumes of resin and myrrh, as physicians correct the foulness, and attenuate the thickness thereof in times of pestilence, by burning sweet woods, juniper, cypress,\* &c.

This I take to be the sum of what can be learned from antiquity in relation to this point; from whence we may see, that writers have concluded a little too hastily for the use of common fires in this case, upon the authority and example of Hippocrates, though we should allow the fact as related by Galen: when it will not from thence appear that Hippocrates himself relied upon them; since he thought it necessary to take in the assistance of aromatic fumes. But as this fact is not grounded upon sufficient authority, so it is needless to insist long upon it. The passage I have brought from Plutarch will better explain what was the sentiment of those physicians who approved the practice. It seems they expected from thence to dispel the thickness and foulness of the air. And no doubt but such evil dispositions of the air as proceed from damps, exhalations, and the like, may be corrected even by common fires, and the predisposition of it from these causes to receive infection sometimes removed. But I think this method, if it be necessary, should be put in practice before the coming of the pestilence. For when the distemper is actually begun, and rages, since it is known to be spread and increased by the heat of

the summer, and on the contrary checked by the cold in winter; undoubtedly, whatever increases that heat, will so far add force to the disease: as Mercurialis takes notice, that smiths, and all those that worked at the fire, were most severely used in the plague at Venice in his time.\* Whether the service fires may do by correcting any other ill qualities of the air, will counterbalance the inconvenience upon this account, experience only can determine: and the fatal success of the trials made here in the last plague, is more than sufficient to discourage any farther attempts of this nature. For fires being ordered in all the streets for three days together, there died in one night following no less than 4,000, (if we may believe Dr. Hodges); whereas in any single week before or after, never twice that number were carried off.† And we find, that, upon making the same experiment in the last plague at Marseilles, the contagion was every day spread more and more through the city with increased rage and violence.‡

What has been said of fires, is likewise to be understood of firing of guns, which some have too rashly advised. The proper correction of the air would be to make it fresh and cool: accordingly the Arabians,§ who were best acquainted with the nature of pestilences, advise people to keep themselves as airy as possible, and to chuse dwellings exposed to the wind, situate high, and refreshed with running waters.

As for houses, the first care ought to be to keep them clean: for as nastiness is a great source of infection, so cleanliness is the greatest preservative; which shows us the true reason why the poor are most obnoxious to contagious diseases. It is remarked of the Persians, that though their country is surrounded every year with the plague, they seldom or never suffer anything by it themselves: and it is likewise known, that they are the most cleanly people of any in the world, and that many among them make it a great part of their religion to remove filthiness and nuisances of every kind from all places about their cities and dwellings.||

Besides this, the Arabians advise the keeping houses cool, as another method of their purification; and therefore, to answer this end more fully, they directed to strew them with cooling herbs, as roses, violets, water-lilies, &c., and to be washed with water and vinegar: than all which, especially the last, nothing more proper can be proposed. I think it not improper likewise to fume houses with vinegar, either alone or together with nitre, by throwing it upon a hot iron or tile; though this be directly contrary to what modern authors mostly advise, which is to make fumes with hot things, as benzoin, frankincense, storax, &c., from which I see no reason to expect any virtue to destroy the matter of infections, or to keep particular places from a disposition to receive it; which are the only things here to be aimed at. The smoke of sulphur, perhaps, as it abounds with an acid spirit, which is found by experience to be very penetrating, and to have a great power to repress fermentations, may promise some service this way.

As hot fumes appear to be generally useless, so the steams of poisonous minerals ought to be reckoned dangerous: and therefore I cannot but dissuade the use of all fumigations with mercury or arsenic. Much less would I advise, as some have done, the wearing arsenic upon the pit of the stomach as an amulet: since this practice has been often attended with very ill consequences, and is not grounded upon any good authority, but probably derived from an error in mistaking the Arabian word *darsini*, which signifies cinnamon, for the Latin *de arsenico*, as I have formerly shown.¶

The next thing after the purifying of houses, is to consider by what means particular persons may best defend themselves against contagion: for the certain doing of which, it would be necessary to put the humours of the body into such a state, as not to be alterable by the matter of infection. But since this is no more to be hoped for, than a specific preservative from the small-pox; the most that can be done, will be to keep the body in such order, that it may suffer as little as possible. The first step towards which, is to maintain a good state of health, in which we are always least liable to suffer by any external injuries; and not to weaken the body by evacuations. The next is, to guard against all dejection

\* De peste, c. 22.

† Hodges, de peste, p. 24.

‡ Journal de la peste de Marseilles, p. 19, and relation historique de tout ce qui s'est passé à Marseilles pendant la dernière peste, p. 77.

§ Rhazes de re medica, lib. iv. c. 24. and Avicenn. can. med. lib. iv. c. 1.

|| Gauderau relation des espèces de la peste que reconnoissent les Orientaux.

¶ Mech. account of poisons, essay 3.

\* Plutarch, lib. de Isid. & Osir.



(Papers handed in by Professor E'gar March Crookshank, M.B.)

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of spirits, and immoderate passions: for these we daily observe do expose persons to the more common contagion of small-pox. These ends will be best answered by living with temperance upon a good generous diet, and by avoiding fastings, watching, extreme weariness, &c. Another defence is, to use whatever means are proper to keep the blood from inflaming. This, if it does not secure from contracting infection, will at least make the effects of it less violent. The most proper means for this, according to the advice of the Arabian physicians, is the repeated use of acid fruits, as pomegranates, Sevil oranges, lemons, tart apples, &c.; but above all, of wine-vinegar in small quantities, rendered grateful to the stomach by the infusion of some such ingredients as gentian root, galangal, zedoary, juniper berries, &c. Which medicines by correcting the vinegar, and taking off some ill effect it might otherwise have upon the stomach, will be of good use: but these, and all other hot aromatic drugs, though much recommended by authors, if used alone, are most likely to do hurt by over heating the blood.

I cannot but recommend likewise the use of issues. The properest place for them I take to be the inside of the thigh a little above the knee. Besides, the smoking tobacco, much applauded by some, since it may be put in practice without any great inconvenience, need not, I think, be neglected.

But since none of these methods promise any certain protection; as leaving the place infected is the surest preservative, so the next to it is to avoid, as much as may be, the near approach to the sick, or to such as have but lately recovered. For the greater security herein, it will be advisable to avoid all crowds of people. Nay, it should be the care of the magistrate to prohibit all unnecessary assemblies; and likewise to oblige all who get over the disease, to confine themselves for some time, before they appear abroad.

The advice to keep at a distance from the sick, is also to be understood of the dead bodies; which should be buried at as great a distance from dwelling-houses, as may be; put deep in the earth; and covered with the exactest care; but not with quick lime thrown in with them, as has been the manner abroad: for I cannot but think that this, by fermenting with the putrefying humours of the carcases, may give rise to noxious exhalations from the ground. They should likewise be carried out in the night, while they are yet fresh and free from putrefaction: because a carcase not yet beginning to corrupt, if kept from the heat of the day, hardly emits any kind of steam or vapour.

As for those who must of necessity attend the sick, some farther directions should be added for their use. These may be comprehended in two short precepts. One is, not to swallow their spittle while they are about the sick, but rather to spit it out: the other, not so much as to draw in their breath, when they are very near them. The reason for both these appears from what has been said above concerning the manner in which a sound person receives the infection. But in case it be too difficult constantly to comply with these cautions, washing the mouth frequently with vinegar, and holding to the nostrils a sponge wet with the same, may in some measure supply their place.

This is the sum of what I think most likely to stop the progress of the disease in any place where it shall have got admittance. If some few of these rules refer more particularly to the city of London, with small alteration they may be applied to any other place. It now remains therefore only to lay down some directions to hinder the distempers spreading from town to town. The best method for which, where it can be done, (for this is not practicable in very great cities), is to cast up a line about the town infected, at a convenient distance; and by placing a guard, to hinder people's passing from it without due regulation, to other towns: but not absolutely to forbid any to withdraw themselves, as was done in France, according to the usual practice abroad; which is an unnecessary severity, not to call it a cruelty. I think it will be enough, if all who desire to pass the line, be permitted to do it, upon condition they first perform quarantine for about 20 days in tents, or other more convenient habitations. But the greatest care must be taken, that none pass without conforming themselves to this order; both by keeping diligent watch, and by punishing, with the utmost severity, any that shall either have done so, or attempt it. And the better to discover such, it will be requisite to oblige all who travel in any part of the country, under the same penalties, to carry with them certificates either of their

coming from places not infected, or of their passing the line by permission.

This I take to be a more effectual method to keep the infection from spreading, than the absolute refusing a passage to people upon any terms. For when men are in such imminent danger of their lives where they are, many, no doubt, if not otherwise allowed to escape, will use endeavours to do it secretly, let the hazard be ever so great. And it can hardly be, but some will succeed in their attempts; as we see it has often happened in France, notwithstanding all their care. But one that gets off thus clandestinely, will be more likely to carry the distemper with him than 20, nay, 100, that go away under the proceeding restrictions; especially because the infection of the place he flies from, will by this management be rendered much more intense. For confining people, and shutting them up together in great numbers, will make the distemper rage with augmented force, even to the increasing it beyond what can be easily imagined: as appears from the account which the learned Gassendus\* has given us of a memorable plague, which happened at Digne in Provence, where he lived, in the year 1629. This was so terrible, that in one summer out of 10,000 inhabitants, it left but 1,500, and of them all but five or six had gone through the disease. And he assigns this, as the principal cause of the great destruction, that the citizens were too closely confined, and not suffered so much as to go to their country houses. Whereas in another pestilence which broke out in the same place a year and a half after, more liberty being allowed, there did not die above 100 persons.

For these reasons, I think, to allow people with proper cautions to remove from an infected place, is the best means to suppress the contagion, as well as the most humane treatment of the present sufferers: and, under these limitations, the method of investing towns infected, which is certainly the most proper that can be advised, to keep the disease from spreading, will be no inconvenience to the places surrounded. On the contrary, it will rather be useful to them; since the guard may establish such regulations for the safety of those who shall bring provisions, as shall remove the fears which might otherwise discourage them.

The securing against all apprehensions of this kind, is of so great importance, that in cities too large to be invested, as, for example, this city of London, the magistrates must use all possible diligence to supply this defect, not only by setting up barriers without their city, but by making it in the most particular manner their care to appoint such orders to be observed at them, as they shall judge will be most satisfactory to the country about. Though liberty ought to be given to the people, yet no sort of goods must by any means be suffered to be carried over the line which are made of materials retentive of infection. For in the present case, when infection has seized any part of a country, much greater care ought to be taken, that no seeds of the contagion be conveyed about, than when the distemper is at a great distance: because a bale of goods, which shall have imbibed the contagious aura when packed up in Turkey, or any remote parts, when unpacked here, may chance to meet with so healthful a temperament of our air, that it shall not do much hurt. But when the air of any one of our towns shall be so corrupted, as to maintain and spread the pestilence in it, there will be little reason to believe, that the air of the rest of the country is in a much better state.

For the same reason quarantines should more strictly be enjoined, when the plague is in a bordering kingdom, than when it is more remote.

The advice here given with respect to goods, is not only abundantly confirmed from the proofs I have given above, that goods have a power of spreading contagion to distant places; but might be farther illustrated by many instances of ill-effects from the neglect of this caution in times of the plague. I shall mention two, which happened among us during the last plague. I have had occasion already to observe, that the plague was in Poole. It was carried to that place by some goods contained in a pedlar's pack. The plague was likewise at Eham in the Peak of Derbyshire, being brought thither by means of a box sent from London to a tailor in that village, containing some materials relating to his trade. There being several incidents in this latter instance, that will not only serve to establish in particular the precepts I have been giving in relation to goods, but likewise all the rest of the directions that

\* Notitia ecclesiæ Dimiensis.



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*(Papers handed in by Professor Edgar March Crookshank, M.B.)*

have been set down for stopping the progress of the plague from one town to another; I shall finish this chapter with a particular relation of what passed in that place. A servant, who first opened the foresaid box, complaining that the goods were damp, was ordered to dry them at the fire; but in doing it was seized with the plague, and died: the same misfortune extended itself to all the rest of the family, except the tailor's wife, who alone survived. From hence the distemper spread about, and destroyed in that village, and the rest of the parish, though a small one, between two and three hundred persons. But, notwithstanding this so great violence of the disease, it was restrained from

reaching beyond that parish by the care of the rector; from whose son, and another worthy gentleman, I have the relation. This clergyman advised, that the sick should be removed into huts or barracks built upon the common; and procuring, by the interest of the then Earl of Devonshire, that the people should be well furnished with provisions, he took effectual care, that no one should go out of the parish: and by this means he protected his neighbours from infection with complete success.

I have now gone through the chief branches of preservation against the plague, and shall conclude with some general directions concerning the cure.

WOODVILLE'S VARIOLA-VACCINE: EVAN'S CASES.  
 ("Medical and Physical Journal," 11th September 1799.)  
 (See Question 11,227.)

		Years of Age.	Months.	Days Indisposed.	No. of Pustules.			Years of Age.	Months.	Days Indisposed.	No. of Pustules.
Thomas Leicester	-	2	6	1	12	Elizabeth Lloyd	-	3	6	—	3
Mary Leicester	-	—	4	2	40	Ann Roberts	-	5	6	2	40
Jane Stevens	-	2	6	2½	6	Mary Roberts	-	2	6	1	6
John Perry	-	1	6	1	16	Hugh Thomas	-	2	—	1	—
Charles Plimmer	-	10	—	1	30	Elizabeth Cadman	-	7	—	—	—
Thomas Plimmer	-	15	—	1	—	Morris Cadman	-	4	—	—	—
Mary Plimmer	-	12	—	2	—	James Cadman	-	3	—	3	—
Mathew Williams	-	—	7	—	—	Sarah Jones	-	4	—	3	—
Martha Morgan	-	—	9	2	—	William Jones	-	2	—	—	—
Mary Roson, sen.	-	22	—	3	15	Thomas Cadman	-	1	—	—	—
Thomas Socket	-	9	—	—	—	Ann Jones	-	—	6	3	2
William Socket	-	5	6	—	—	Ann Barnesley	-	6	—	2	1
Joseph Socket	-	1	—	1	3	Thomas Barnesley	-	3	—	2	3
Thomas Onion	-	1	3	2	20	Thomas Pearce	-	2	—	3	1
Benjamin Burrows	-	2	—	3	50	Maria Briscoe	-	1	6	2	20
Thomas Cranage	-	—	5	3	18	Mark Dod	-	3	—	2	1
Jane Jervis	-	1	—	½	100	Martha Dod	-	1	6	1	50
Mary Phillips	-	2	—	2	50	Thomas Cooke	-	3	—	—	—
Harriet Williams	-	1	3	—	10	Elizabeth Cooke	-	1	—	2	100
Hannah Aaron	-	3	—	3	2	Elizabeth Hill	-	—	6	1	—
John Cooke	-	2	—	1	12	Ann Trickett	-	—	7	1	—
Mary Bird	-	4	—	2	20	Elizabeth Hazle	-	3	—	—	—
Elizabeth Aston	-	1	—	—	4	Rebecca Hazle	-	—	9	—	—
Mary Roson, jun.	-	—	4	1	6	William Onions	-	2	—	—	—
John Radcliffe	-	4	—	—	—	Jacob Brooks	-	1	6	—	—
Eleanor Radcliffe	-	2	6	—	—	Maria Brice	-	2	6	1	29
Stephen Smith	-	2	6	—	—	William Brice	-	1	—	½	30
James Burns	-	1	6	—	8	John Churn	-	4	—	1	—
Willam Dean	-	3	—	1	—	Thomas Churn	-	2	—	2	—
Ann Wright	-	1	6	2	5	James Churn	-	—	3	1	—
Ann Onions	-	—	8	½	8	Mary Ann Parker	-	—	10	½	12
Francis Gregory	-	7	—	2	6	John Hazle	-	3	—	2	100
Elizabeth Gregory	-	5	—	—	—	William Pincher	-	1	3	½	3
Robert Ellis	-	2	—	—	1	John Silvester	-	14	—	2	—



(See Question 11,607.)

3 F 5







(Papers handed in by Professor Edgar March Crookshank, M.B.)

App. No. 1.

THE VARIOLOUS TEST AFTER COW-POX: STEVENSON'S CASES.

(See Question 11,726.)

In the "Medical and Physical Journal," 1801 (Vol. 6, page 121), Mr Stevenson gives two cases in which in no instance that had come to his knowledge had the diagnostic symptoms of the genuine cow-pox been so clearly marked and so fully divested of obscurity in every particular. The cases are as follows:—

Master Thomas Harvey, Toton, Notts, aged two years, was inoculated with vaccine matter on the 1st of June 1800, taken from a young lady in the same village on the ninth day of the disease, and immediately inserted, without dilution in its perfectly limpid state, into both arms. On the fourth day the matter had evidently taken effect, and on the fifth a small vesicle appeared, which gradually enlarged till the eighth, when my patient became uneasy, fretful, and somewhat feverish. These symptoms abated in the space of 48 hours. The beautiful circumscribed efflorescence or areola around the pustule, which was distended with a transparent fluid, continued to increase in circumference till the twelfth day. From this period it spontaneously, though gradually, subsided, the matter in the pustule being all this time of an aqueous colour and consistence. The pustule began now to assume a dark complexion, and an eschar formed which separated about a fortnight afterwards. On the ninth day a few red eruptions appeared, scattered thinly over the body like measles, which in the space of four days turned brown, and soon desquamated, nor did they contain any fluid during their continuance. In short, I know not of any variation in the symptoms from the commencement to the termination of the disease from those which uniformly occur in the cow-pox, save two cutaneous eruptions which are not a necessary or usual concomitant. On the eighth day Master Edward Harvey, aged seven years, was inoculated with matter taken from his brother. It would be nugatory to state the particulars of his symptoms, and it is only necessary to mention that he went through

the disease in a more mild, though equally distinct, form.

In six months afterwards both these young gentlemen were inoculated with recent variolous matter, in order to remove from the minds of their parents all doubts of the efficacy of the cow-pox as a preservative against the contagion of the variola. As for myself I entertained not the least apprehension of any effects from the inoculation, and in this conviction I deemed a preparative course quite superfluous. The matter which had been thus introduced, instead of dying away on the third or fourth day as I had anticipated, began to produce inflammation on both their arms. You may conceive my confusion and chagrin when on the eighth day I received a message requesting me to visit my young patients, who complained of headache, chilliness, sickness, and the other precursory symptoms of small-pox. On my arrival I found to my sincere regret that there was little doubt of their having the genuine variolous fever. The pustules on the arms of both were fully distended with purulent matter and considerably inflamed around their margins. In Master Edward, on the following day, a full crop of eruptions supervened. With respect to his brother, the eruptive fever was much milder, a circumstance that was owing probably to his being more exposed to the open air in addition to the very soluble state of his bowels. The pustules too never attained to that high degree of maturity as in Master Edward. For after being red, and bounded by a marginal inflammation, and being filled with a much less proportion of purulent contents, they sooner turned brown and exsiccated; a symptom not unusual in very favourable cases of variola.

That this secondary disease was the real small-pox admits not of a doubt, since many children were inoculated successfully with matter taken from Master Edward.

THE SCAR THEORY: CAMPER'S EXPERIMENTS.

(See Question 11,889.)

Camper (*Dissertatio de Emolumentis et Optimo Methodo Insitionis Variolarum*, 1774) made experiments to ascertain whether the number of punctures made or the quantity of variolous matter introduced into the punctures bore any relation to the number of pustules which afterwards appeared. His results were as follows:—

	Punctures.	Pustules.
1. Two punctures in each arm -	- 4 produced	15
2. ditto ditto -	- 4 "	12
3. ditto ditto -	- 4 "	300
4. Two ditto in one arm and one in the other -	- 3 "	3
5. ditto ditto -	- 3 "	50
6. Three ditto in one arm -	- 3 "	4
7. Two ditto in one arm -	- 2 "	1,000
8. Three ditto in one arm and two in the other -	- 5 "	4
9. Two ditto in one arm -	- 2 "	230
10. Three ditto in both arms -	- 6 "	12

	Punctures.	Pustules
11. Four ditto in one arm and three in the other -	- 7 produced	4
12. Two ditto in one arm -	- 2 "	1,500

With reference to these cases Thomson says, "From these experiments Camper justly concluded that the number of small-pox pustules succeeding to inoculation depends neither upon the number of the punctures which are made nor upon the quantity of matter introduced into the system. From the knowledge we possess of the action of other specific poisons upon the human body such results are exactly what might have been expected, and the great difference in respect to the relative proportion of the number of punctures made and pustules produced can only be referred to particular diversities in the constitutions of those upon whom the experiments were performed."

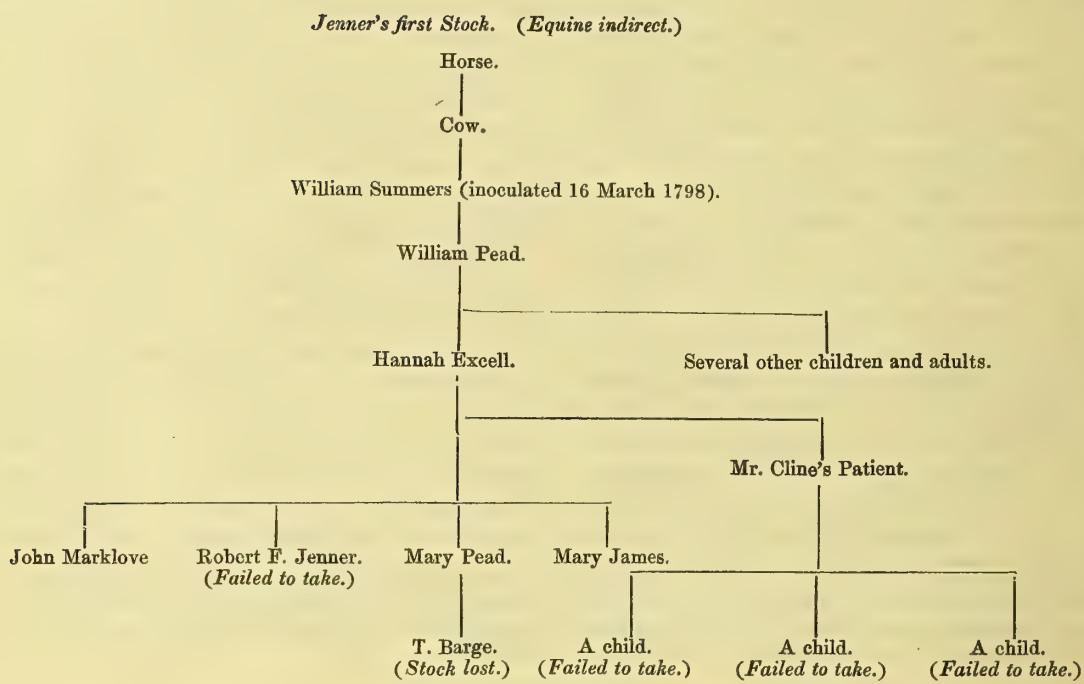
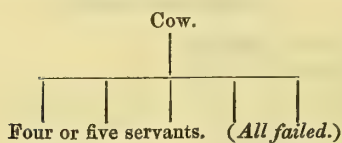
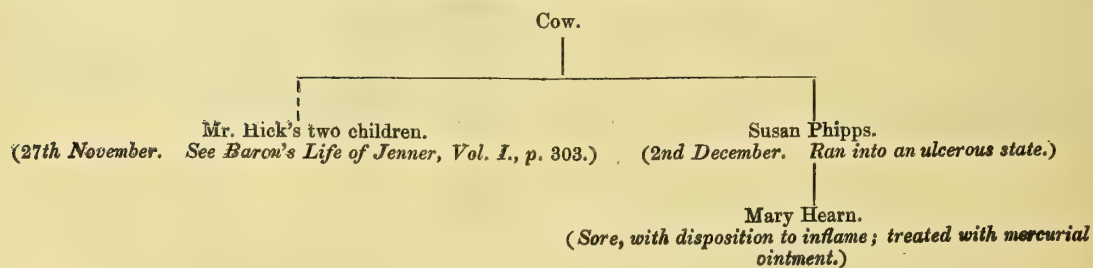


App. No. 1.

(Papers handed in by Professor Edgar March Crookshank, M.B.)

## PEDIGREES OF JENNER'S STOCKS OF LYMPH AND OF DARKE'S STOCK OF STONEHOUSE LYMPH.

(See Question 11,978.)

*Jenner's Berkeley Lymph. (Summer of 1798.)**Jenner's Stonehouse Lymph. 26th November 1798.)*



(Papers handed in by Professor Edgar March Crookshank, M.B.)

*Darke's Stock of Stonehouse Lymph.* (13th and 14th December 1798.)

Vick, Dr. Darke's  
servant.  
(Failed; 6th day a  
small scab.)

Miss Colborne.  
(Some hardness and  
elevation, hardly per-  
ceptible 6th day, 10th  
was quite gone.)

Miss S. Colborne.  
(Hardness and eleva-  
tion to 9th day, crust  
fell off on 14th.)

Miss E. Colborne.  
(10th day vesication;  
followed by utcera-  
tion; treated with  
mercurial ointment.  
Suppuration fol-  
lowed.)

W. King, Mr. Col-  
borne's servant.  
(Vesication, ulcera-  
tion. Some local  
effect on application  
of variolous test.)

(Inoculated with small-pox on the 8th day from the inoculation with  
cow-pox—all took.)

*Jenner's Stock of Woodville's Variola-Vaccine.* (See Jenner's "Further Observations on the Variolæ Vaccinæ or Cow-pox" and Baron's Life of Jenner, Vol. I., p. 324.)

(Supplied from Ann Bumpus, who had over 300 pustules of small-pox.)

Stephen Jenner.  
(Spots on the arm, three on the  
face, two fresh spots on face.)

James Hill.  
("The vesicle . . . assuming  
"more perfectly the variolous  
"character than is common with the  
"cow-pox at this stage.")

Mr. Hick's children.

Servants, and people in Mr. Hick's manufactory.

Child, 20 hours old, inoculated by  
Henry Jenner.

107 persons inoculated by Dr. Marshall  
(22nd March—27th April).  
189 more by 8th September 1799.

Total - 296\*

*Jenner's Kentish Town Lymph.*

(Taken by Tanner, a student at the Veterinary College, from a cow at Mr. Clark's farm at Kentish Town. Jenner procured it from Tanner, and immediately conveyed it to Dr. Marshall in Gloucestershire in April 1799.)

127 cases by Dr. Marshall\* by 8th September 1799.

Above 100 cases by Henry  
Jenner.

Many cases by Jenner and  
friends.

\* Marshall's cases - { 296 with Woodville lymph.  
127 with Kentish Town lymph.  
423

Of these 423; 211 "were subjected to the action of the variolous matter, but every one resisted it" (Marshall).—E. M. C.



(Papers handed in by Professor Edgar March Crookshank, M.B.)

RESULT OF THE VARIOLOUS TEST\* IN TWENTY-ONE CASES "VACCINATED" WITH CEELY'S VARIOLA-VACCINE: TABLE SHOWING THE SEX, AGE, PERIOD AFTER VACCINATION WITH VARIOLA-VACCINE LYMPH, NUMBER AND KIND OF SCARS, AND RESULTS OF THE TEST OF VARIOLOUS INOCULATION OF TWENTY-ONE SUBJECTS.

(See Question 12,299.)

No.	Sex.	Age.	Period after vaccination.	Number and kind of scars.	Results.
		(Years.)	(Months.)		
1	Girl	11½	5	8 very fine scars -	Two papulæ from the 3rd to 5th day, then declining; 6th, gone.
2	Girl	8½	5	5 very fine scars -	Three papulo-vesicular elevations on the 4th day; declining on the 5th day; desiccating on the 6th day; dark brown crusts on the 7th day.
3	Boy	8½	5	2 large, 2 small -	Two papulo-vesicular elevations on the 5th day; declining on the 6th day; desiccating with brown crusts on the 7th day.
4	Girl	8	5	4 fine scars -	Two papulo-vesicular elevations on the 5th day; enlarged, with slight areolæ, on the 6th; small silvery white vesicles, with bright red areolæ, containing a few drops of limpid adhesive lymph, on the 7th; bluish vesicles, with pulsating areolæ, on the 8th; declining on the 9th; desiccating on the 10th.
5	Boy	7½		4 fine scars -	Two papulo-vesicular elevations, enlarging with tawny jagged areolæ, on the 6th; declining, with yellowish brown crusts, on the 7th; incrusting on the 8th; small brown crusts, like modified vaccine, forcibly removed on the 12th; numerous hard warty papulæ on the face, trunk, and limbs, on the 14th; several suppurated on the 16th day; all decedent on the 18th. Very slight fever for a few hours at commencement of eruption.
6	Boy	7½	5	3 small scars -	Three papulo-vesicular elevations on the 7th day, with small areolæ; took a few drops of adhesive limpid lymph; declined on the 9th; yellowish crusts on the 10th.
7	Boy	1½	5	4 very fine scars -	Two papulo-vesicular elevations on the 5th day; large glistening vesicles like vaccine on the 7th day, with small areolæ; pale flesh-coloured vesicles, with patches of brown crust on hard bases, on the 8th; very fine vesicles (like vaccine of the 14th day) this 9th day; "tamarind-stone" crusts on the 10th day.
8	Girl	4	12	4 small scars -	Three papulo-vesicular elevations on the 5th day; increasing with areolæ on the 6th; declining on the 8th, with minute brown crusts.
9	Girl	7	13	4 good scars -	Three papulo-vesicular elevations on the 5th day; with areolæ on the 6th; and limpid adhesive lymph on the 8th; declining on the 9th, with yellowish brown crusts.
10	Girl	6	13	4 good scars -	Precisely the same.
11	Girl	4	13	4 very good scars	Nearly the same; but vesicles larger with more areolæ on the 8th day; with a few hours' fever and pain in the arm; all declining on the 9th day.
12	Boy	11	14	4 fine scars -	Trivial fugitive inflammation for two days.
13	Girl	7	26	2 good scars -	Two papulæ on the 4th; on the 6th gone.
14	Girl	2½	29	4 fine scars -	Two papulo-vesicular elevations on the 6th day, with slight areolæ; declining on the 8th; desiccating with brown crusts on the 10th day.
15	Girl	5	29	2 small scars -	Two papulo-vesicular elevations on the 6th day; with slight areolæ on the 7th; declining and desiccating on the 8th and 9th days.
16	Boy	4	29	1 small scar -	Two papulo-vesicular elevations on the 5th day; slight areolæ on the 6th; declining on the 8th; encrusted on the 10th.
17	Girl	5	30	2 small scars, 1 large scar	Two papulæ on the 6th day; vesicular on the 7th; ash-coloured vesicles on the 8th, on dark red base; decedent and encrusted on the 10th day.
18	Boy	5	30	1 fine scar -	Two vesicular tubercles on the 5th day, with areolæ; encrusted on the 7th day.
19	Boy	2½	30	1 fine scar -	Two fugitive inflamed spots; 6th day, gone.
20	Girl	17	30	5 good scars -	Four small tubercular vesicles on the 5th day; decedent on the 6th day, no lymph; 9th day, brown crusts.
21	Boy	14	31	5 fine scars -	Two vesicular tubercles on the 6th day, with areolæ; advancing, with pain in axilla and head, and slight fever, on the 8th day; rapidly decedent on the 9th day; with brown crusts on the 10th.

\* "The variolous matter employed was recent, taken on the sixth and seventh day, perfectly limpid, . . . . ."  
 "We see therefore that not only the limpid and adhesive lymph of these 'test' varioloid vesicles will produce variola by inoculation; but that the fever, though slight and fugitive, which sometimes attends such 'testing' is occasionally specific and infectious. But these warnings now are needless; the 3rd and 4th of Victoria, c. 29. will doubtless altogether supersede them" (Ceely.) Compare the results of testing with the results obtained by Dimsdale, Adams, and Guillon in persons who had neither had small-pox or cow-pox.—E. M. C.



## APPENDIX II.

*(Papers handed in by Mr. Lionel Percy Chamberlain, 4th February 1891.)*

App. No. 2

TABLE A.

TABLE showing the number of Births and of Public and Private Vaccinations registered in the Leicester Union in each of the years 1849-67.

*(The figures in this table have been compiled from the Public Registers, and complete the period from the date of the earliest Vaccination Return for the Union down to the appointment of a Vaccination Officer by the Board of Guardians in 1868.)*

Years.	Births.	Vaccinations.			Estimated Deaths before Vaccination.	Cost.
		Total.	Public.	Private.		
1849	2,171	1,859	1,549	310*		
1850	2,239	2,050	1,708	342*		
1851	2,437	1,353	1,127	226*		
1852	2,387	1,637	1,364	273*		
1853	2,283	1,843	1,536	307*		
1854	2,457	2,271	1,894	377*		
1855	2,486	1,783	1,482	301*		
1856	2,402	1,759	1,470	289*		
1857	2,441	1,881	1,567	314*		
1858	2,276	2,026	1,688	338*		
1859	2,518	1,447	1,206	241*		
1860	2,567	1,766	1,472	294*		
1861	2,540	1,614	1,345	269*		
1862	2,723	1,187	1,157	30	242	
1863	2,937	1,601	1,237	364	275	
1864	3,114	1,925	1,196	729	307	(In 1863-4 an epidemic of small-pox occurred, and owing to the efforts of the Medical Officers, acting under instructions from the Board of Guardians, 3,928 additional vaccinations and re-vaccinations were performed. One Medical Officer presented accounts for vaccination fees amounting during the year to 201 <i>l.</i> 16 <i>s.</i> 6 <i>d.</i> This extraordinary amount was at first disallowed, but after considerable correspondence with the Poor Law Board it was finally paid to him by the Guardians.)
1865	3,226	1,308	969	339	295	
1866	3,412	1,637	1,356	281	305	
1867	3,498	1,450	1,432	18	350	

\* From the year 1862 and onwards the records of the public and private vaccinations are complete and continuous. Prior to this date, owing to the registers for one district of the Borough being destroyed, it is difficult to ascertain the exact number of the private vaccinations; but the record of the public vaccinations is complete. In the above table the private vaccinations from 1849 to 1861 are estimated on the mean average obtained from those years for which official returns exist.

TABLE B.

TABLE showing the number of Births and of Public and Private Vaccinations registered in the Leicester Union in each of the years 1868-72.

*(The figures in this table, referring to the period from the appointment of a Vaccination Officer by the Board of Guardians in 1868 down to the date when the Vaccination Act of 1871 came into force, have been compiled from the Vaccination Registers.)*

Years.	Births.	Vaccinations.			Estimated Deaths before Vaccination.	Cost.
		Total.	Public.	Private.		
1868	3,588	3,179	1,731	1,448	387	£ s. d. 195 1 10
1869	3,760	3,254	2,557	697	351	(for half the year, from July 1st, only). 298 5 2
1870	3,799	3,106	2,141	965	358	272 10 3
1871	3,982	3,736	2,764	972	197	302 11 2
1872	4,162	3,572	2,612	960	414	541 17 4½



*(Papers handed in by Mr. Lionel Percy Chamberlain.)*

TABLE C.

TABLE showing the number of Births registered in the Leicester Union in each of the years 1873-89, and the number of each year's Births Successfully Vaccinated, or otherwise accounted for as regards Vaccination.

*(The whole of the figures in this table relate only to the births tabulated for each year respectively. Hence, for instance, the total number of persons summoned in any one year refers only to the parents of children born within that year who became amenable to the law within the period ending with the first six months of the following year. Consequently the total number of persons summoned (3,289) as it stands in this table does not accord with the number tabulated in the police returns, which give a total of upwards of 6,000. Many proceedings before the magistrates took place after the date when each year's return was made out, and these cases, therefore, are not included in this return.)*

Year.	No. of Births Registered.	Successfully Vaccinated.	Insusceptible.	Had Small-pox.	Dead Unvaccinated.	Postponed by Medical Certificate.	Removed to Districts the Vaccination Officer of which has been apprised.	Cases Removed and not found.	No. unaccounted for in previous Columns.	No. Summoned.	No. Vaccinated by Public Vaccinators.	Cost.
1873	4,446	3,730	6	—	555	5	30	105	15	15	2,266	£ s. d. 353 7 7
1874	4,365	3,590	9	—	643	19	31	66	7	7	2,700	363 1 0
1875	4,256	3,400	10	—	662	12	21	97	54	54	2,115	336 12 7
1876	4,773	3,650	9	1	679	27	39	230	138	138	2,188	347 17 11
1877	4,749	3,509	7	—	647	37	28	317	204	204	2,318	374 0 7½
1878	4,777	3,260	4	—	707	108	55	411	232	232	2,106	344 12 0
1879	4,695	3,086	2	—	722	25	42	538	280	259	2,036	331 5 0
1880	4,860	3,010	5	—	816	14	42	573	400	400	1,904	333 15 1
1881	4,712	2,948	3	—	687	47	25	511	491	491	2,172	428 5 0
1882	4,855	2,660	7	—	720	36	8	606	816	693	1,807	367 14 3
1883	4,819	1,732	6	—	612	78	8	477	1,906	186	1,300	321 0 7
1884	4,849	1,700	9	1	818	24	1	606	1,690	512	776	273 16 9
1885	4,690	1,376	5	—	421	24	—	116	2,747	98	1,017	298 13 1
1886	4,874	593	1	—	691	15	1	91	3,476	Nil	559	263 6 11
1887	4,693	322	3	—	553	4	—	79	3,732	Nil	164	180 18 6
1888	4,815	219	—	—	715	—	2	209	3,670	Nil	59	176 5 6
1889	4,786	126	4	—	765	—	1	253	3,637	Nil	18	167 16 8
Totals	80,014	38,916	90	2	11,413	475	334	5,287	23,495	3,289	25,505	5,262 9 0½



APPENDIX III.

(Papers handed in by Mr. John Thomas Biggs, 18th February, 11th March, 22nd and 29th April, 27th May, 3rd, 10th, 17th, and 24th June, and 1st, 8th, 15th, and 22nd July 1891.)

App. No. 3.

TABLE 1.

TABLE showing, for the Borough of Leicester, for each of the years 1868-89, the number of persons against whom proceedings under the Vaccination Acts were taken, with the results of such proceedings.

Year.	Num-ber pro-ceeded against.	Num-ber dis-missed.	Orders made			Num-ber fined.	Num-ber to pay Costs with Fine.	Amount of Costs where Orders were made.	Amount of Fines.	Amount of Costs in addition to Fines.	Distress War-rants issued.	Amount of Fines to be recovered.	Amount recovered with Costs.	Num-ber wh went to Gaol in default.
			With Costs.	With out Costs.	Total.									
1868	2	2	—	—	—	—	—	£ s. d.	£ s. d.	£ s. d.	—	£ s. d.	£ s. d.	—
1869	12	4	—	—	—	8	—	—	8 0 0	—	—	—	—	3
1870	24	8	—	—	—	16	—	—	16 0 0	—	—	—	—	3
1871	15	5	—	—	—	10	—	—	10 0 0	—	—	—	—	3
1872	49	27	—	—	—	22	—	—	19 7 0	—	—	—	—	4
1873	20	7	—	—	—	13	—	—	13 0 0	—	—	—	—	—
1874	19	7	—	—	—	12	—	—	11 5 0	—	—	—	—	—
1875	27	10	—	—	—	17	—	—	17 0 0	—	—	—	—	1
1876	107	17	—	4	4	81	5	—	76 0 0	4 3 0	—	—	—	10
1877	238	39	—	8	8	171	20	—	84 10 0	18 11 0	—	—	—	4
1878	254	53	—	14	14	179	6	—	89 0 0	6 16 0	—	—	—	2
1879	287	76	—	16	16	187	8	—	93 17 0	6 17 0	—	—	—	3
1880	132	19	3	38	41	4	68	0 12 0	2 0 0	33 15 0	—	—	—	—
1881	1,154	211	231	22	253	657	33	46 10 0	328 10 0	29 1 0	—	—	—	—
1882	918	143	29	12	41	691	43	5 16 0	349 10 0	36 11 0	10	5 0 0	6 0 0	6
1883	515	98	1	—	1	385	31	0 4 0	192 10 0	19 9 6	52	27 0 0	30 1 0	7
1884	529	63	72	2	74	372	20	14 8 0	185 0 0	17 2 0	44	21 18 0	18 12 0	18
1885	1,265	138	528	15	543	556	28	105 12 0	292 10 0	11 5 6	48	20 0 6	7 17 6	—
1886	467	67	120	—	120	270	10	24 0 0	135 0 0	8 17 0	39	18 19 6	13 13 6	—
1887	3	3	—	—	—	—	—	—	—	—	—	—	—	—
1888	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1889	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals -	6,037	997	984	131	1,115	3,651	274	197 2 0	1,922 9 0	192 8 0	193	92 18 0	76 4 0	64

Summary of Fines and Costs.

Costs on Orders	-	-	-	-	-	£	s.	d.
Fines	-	-	-	-	-	197	2	0
Costs with Fines	-	-	-	-	-	1,922	9	0
Proceeds of Sales	-	-	-	-	-	192	8	0
Total	-	-	-	-	-	£2,388	3	0



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 2.

TABLE showing, for the Borough of Leicester, for each of the periods 1874-7, 1878-81, 1882-5 and 1886-9, the average annual death-rate from Erysipelas of children under one year of age per 10,000 Births, of children under five years of age per 100,000 living at that age, and at all ages per 100,000 of the population ; with the average annual per-centage of Vaccinations to Births during each period.

Period.	Average annual death-rate under 1 year per 10,000 Births.	Average annual death-rate under 5 years per 100,000 children living at that age.	Average annual death-rate at all ages per 100,000 total population.	Average annual per-centage of Registered Vaccinations to the total Births.
1874-77 - - - -	19·3	64·0	21·0	79·4
1878-81 - - - -	7·9	24·8	9·2	67·4
1882-85 - - - -	9·4	29·4	6·2	45·1
1886-89 - - - -	4·7	12·6	5·2	10·8

TABLE 3.

TABLE showing, for England and Wales, for each of the years 1859-89, the number of deaths registered from "Erysipelas after Vaccination" and from "Cow-pox and other effects of Vaccination."

[Extracted from the Annual Returns of the Registrar-General.]

Period.	Years.	Number of Deaths.	Average annual Deaths.	Total Deaths in period.
1859-67. (Nine years.)  Vaccination obligatory.	{ 1859 1860 1861 1862 1863 1864 1865 1866 1867	5	{     6·8	61
		3		
		2		
		3		
		11		
		13		
		10		
		10		
		4		
1868-71. (Four years.)  Vaccination enforced by penalties under the Act of 1867.	{ 1868 1869 1870 1871	9	{   18·0	72
		19		
		20		
		24		
1872-80. (Nine years.)  Vaccination more rigorously enforced under the supplementary Act of 1871.	{ 1872 1873 1874 1875 1876 1877 1878 1879 1880	16	{    28·5	257
		19		
		29		
		37		
		21		
		29		
		35		
		32		
		39		
1881-89. (Nine years.)  Vaccination still rigorously enforced as in period 1872-80, but deaths now registered as "Cow-pox "and other effects of Vaccination."	{ 1881 1882 1883 1884 1885 1886 1887 1888 1889	58	{    53·0	476
		65		
		55		
		53		
		52		
		45		
		45		
		45		
		58		
Total number of Deaths registered from "Erysipelas after Vaccination" and from "Cow-pox and other "effects of Vaccination" 1859 to 1889.				866



TABLE\* of Injuries and Deaths following Vaccination; and of Small-pox following Vaccination.

No.	Name.	The testimony of the parents.						Effects produced.	Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.				
1	Allcroft, G. J.	About July 1871	6 weeks	A child's arm	"As clear as a bell"	-	Inflammation appeared in the arm right down to his fingers, followed by pimples all over the body down to the feet. The child was ill six months.	The doctor said it was "through vaccination."	
2	Atkins, S.	About Sept. 1880	Over 6 months	"	"All right"	-	The vaccinated arm became red and swollen down to the finger nails. The child was ill three months.	The parents have since refused vaccination for other children, and have been fined for rejecting it.	
3	Atterbury, E.	1879	6 months	"	"Never ailed anything before"	-	The arm became swollen and inflamed. Inward convulsions followed, and the child died in four months.	The mother has one child with bad eyes through vaccination. She would "go to jail" herself rather than have another "done."	
4	Adcock, G.	About July 1876	13 weeks	"	Quite well	-	The arm was much inflamed, and convulsion fits followed. Abscesses also formed on the body under the neck. Well now.	The parents are healthy. One child died, but not from vaccination.	
5	Allen, E.	About Aug. 23rd, 1884	10 weeks	A glass tube	Healthy	-	Eruptions appeared directly after vaccination, and also six months later. Abscesses then formed. The eruptions recur annually.	The parents are healthy. Two other children of theirs are quite well.	
6	Berridge, H. L.	About Aug. 1888	3 months	A child's arm	Quite well	-	The vaccinated arm was badly inflamed, and eruptive sores came about the elbow.	Parents healthy.	
7	Barrett, A.	About March 1879	"	"	"	-	Erysipelas appeared around the pustules, and an abscess formed in the armpit, which was cut by the doctor.		
8	Brooks, H.	1867	"	A tube	"	-	The arm became inflamed from the shoulder to the wrist, and had to be carried in a sling. The chin was covered with sores.	The child died in November 1870. The medical certificate gave "inflammation" as the cause of death.	
9	Button, J.	About Nov. 1875	"	A child's arm	"Quite well before"	-	Inflammation followed in the vaccinated arm, resulting in general weakness, continuing for six years.	The parents are healthy, and so are their other children.	
10	Burdett, B. M.	"	6 months	"	Quite well	-	Eruptions broke out on the head and the neck. The child grew worse, and died at nine months old.	The medical certificate gave "bronchitis" as the cause of death.	
11	Bailey, M. G.	Feb. 1886	3 months	A child's arm	"	-	The whole arm became inflamed and swollen, and the sores discharged. Sores appeared also on the head, neck, and face. The child died aged 34 years, never recovering after vaccination.	Medical certificate of death, "Inflammation of brain." Parents healthy.	
12	Bailey, —	July 15th, 1889	4 months	Calf lymph	"	-	The arm became inflamed down to the elbow, watery "blebs" forming under it. The child rapidly sank, and died 29th July 1889.	Medical certificate, "Death after vaccination."	
13	Bailey, W.	1887	"	A child's arm	"	-	Erysipelas followed all down the arm from the neck to the finger ends, causing death one week after vaccination.	A very bad case. Medical certificate of death, "Erysipelas following vaccination."	
14	Brown, J.	Spring 1871	15 months	"	Very healthy	-	An abscess formed in the neck, which caused intense suffering.		
15	Bunn, A.	April 1883	3 months	"	"A beautiful baby"	-	The arm much inflamed; purging and sickness followed; and, after 14 months' illness, the child died.	Three other children in the same family died in a similar manner after vaccination.	

\* This table is compiled from information furnished by the parents. The phraseology contained in their letters, although much abbreviated, is retained as far as possible, every case entered being attributed by the parents to vaccination.—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No 3.

TABLE 4.—continued.

No.	Name.	The testimony of the parents.						Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.		
16	Broughton, H. G.	April 1880	6 weeks	A tube	Strong and well	Eruptive sores and tumour produced in the head. The child became so emaciated that she could not walk for four years.	One doctor blamed vaccination. The child's ears are still affected.	
17	Bellauney H.	November 1875	5 months	"	Weakly	The vaccinated arm became inflamed and swollen. The child became dangerously ill, and died in a week after the operation.	The vaccination officer said that the child was "well enough to be vaccinated," and "it must be done." The mother paid 2s. 6d. to have it done carefully by a private practitioner.	
18	Ballinger, L. H.	September 1876	4 or 5 months	A child's arm	A fine child	Abscesses formed under the vaccinated arm; "big botches" appeared on the body, and the eyes became inflamed and sore.	The mother had several doctors to the child, one of whom said that the illness was caused by vaccination. Three children in the same family died of consumption following vaccination, and one other child had bad eyes after the operation.	
19	Ballinger, R. H.	November 1873	7 weeks	"	Quite well	Her vaccinated arm was much swollen, and eruptive sores afterwards appeared all over the body.	The child has been taken to three infirmaries. One doctor said it was a case of "blood poisoning."	
20	Bramley, J. B.	August 1887	6 months	"	"Quite well at the time of vaccination."	Purging and fits followed the operation, then a rapid consumption ending in the child's death.	The doctor called it "Consumption of the bowels."	
21	Bedford, E.	July 1884	9 months	From a child of consumptive parents.	"As nice a child as ever was seen."	The arm became a mass of sores, and eruptions appeared all over the body. The child was blind three months, and died after 15 months' illness.	She was placed under eight or nine doctors; one said it was through vaccination. The father would go to prison rather than have another child vaccinated.	
22	Bustin, E.	July 1877	10 weeks	A child's arm	Quite well	The arm was inflamed and the body a mass of sores from head to foot. The eruptions recur annually.	Parents well.	
23	Batty, E.	January 1881	3 months	"	"Fat and healthy"	Inflammation in the vaccinated arm, followed by sickness and diarrhoea; and after seven months' illness death ended her sufferings.	A doctor said that her death was "chiefly owing to vaccination."	
24	Buswell, H.	July 1876	About 3 months	"	"A splendid baby"	The arm became a mass of sores and scabs down to the fingers; then diarrhoea followed with wasting and death. He was found dead in bed.	An inquest was held. The verdict stated that bad lungs were the cause of death.	
25	Bateman, G.	February 1849	5 months	"	"A fine healthy boy"	The arm was bad a month, followed by measles, chicken-pox, and screaming fits, in one of which he died.	Child ill 18 months. Mother thinks the doctor's certificate was "Consumption of the bowels."	
26	Bale, T.	About April 1874	9 months or more	"	"A big healthy boy"	The arm was bad a long time, and an abscess formed in the neck. He suffered greatly.	Parents healthy. One child lost the use of its arm after vaccination. ( <i>See</i> below, No. 27.)	
27	Bale, W.	1861	9 months	From a glass	"As nice a lad as ever was seen."	The pocks did not develop, but the arm was much inflamed. Decline followed, and the child lost the use of one arm and one leg.	The mother had another child which suffered with sores for 12 months after vaccination. She would have no more done.	
28	Balding, M. A.	1875	3 months	A child's arm	Well	Erysipelas immediately followed, leaving weakness in the vaccinated arm.	The arm is still weak (1889).	
29	Bent, M.	1876	5 months	Not known	"	Although well before, general debility followed the operation.		
30	Baxter, J. T.	April 1872	2 weeks	"	Quite well	Sores broke out on the body, followed by debility, wasting, and death. Bones protruded through the skin. The child was nearly always crying after the operation.	The mother's health drooped after being vaccinated with the same lymph as the child. The father also was injured by his vaccination.	



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4—continued.

No.	Name.	The testimony of the parents.					Effects produced.	Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.			
31	Bailess, E. A.	5th July 1880	5 months	A child's arm	Quite well	The operation was followed by running sores on the head and the body.	Child died in 1881 from "scrofula."	Other living children in the family healthy. Some died from inflammation.
32	Bruce, W.	October 1856	About 3 months	"	"	Several abscesses developed on the neck after vaccination		
33	Bailey, W.	February 1873	"	"	"	The body became a mass of sores and much wasted and is still liable to eruptions.		One of the family, named William, died of small-pox at two years of age after vaccination and re-vaccination by Dr. Denton in 1862.
34	Bristock, E.	1881	About 4 months	"	"	Large holes formed in the vaccinated arm, and the child was ill three years.		Others in the family healthy. One child died from fits when teething.
35	Blades, L.	April 1872	About 3 months	"	"	The arm was very much swollen, and the child became an out-patient at the Infirmary.		She still periodically breaks out with a rash, and has had to stay at home from school in consequence.
36	Bent, M. E.	April 1876	About 4 months	A bottle, or glass tube	"	The arm was very bad and swollen. The child became very restless, sank rapidly, and died in a week.		The medical certificate stated "diarrhoea" as the cause of death. The other children are all living and healthy.
37	Burgess, G. H.	"	About 6 months	A child's arm	"	An abscess formed under the vaccinated arm. The parents got no rest night or day, and had to sit up several weeks with the child on account of its sufferings. The pocks ran into one large sore. Eruptions appeared on the neck and the arm. The child suffered much.		The parents healthy.
38	Black, E. A.	September 1882	About 8 months	A tube	"	Sickness, purging, and wasting followed the operation, and the child died in six months a mere skeleton.		The third child suffered from the operation; and the fourth had a large hole eaten in its arm by vaccination. The unvaccinated children are healthy.
39	Cheney, C.	January 1869	About 4 months	A child's arm	"Well and fat"	Foul eruptions came out on the arm, and "blister pox" followed. Matter oozed out of the knees and joints. The sores still break out annually.		The parents are strong and healthy.
40	Cheney, R.	September 1880	4 months	"	"Not a blemish"	The vaccinated arm became a complete mass of sores, followed by a dry cracking skin on the hands. The child was ill six months.		An infirmiry doctor said it was through vaccination. Two children which are unvaccinated are healthy and free from spots.
41	Curtis, M. F.	1870	5 or 6 months	"	Quite well	The arm and face became a mass of sores. The parents "thought his ear would rot off." The child was ill from six to eight months.		The parents are well. Eight other children are well, and none are affected like this one.
42	Clements, W. J.	1860	In infancy	From a healthy-looking child.	"Not a nicer child born"	Sores broke out all over the body, healing and breaking out alternately until the child died of measles and abscesses.		Two other children of the same family suffered after vaccination. Living and well now (1890).
43	Curtis, G.	January 1883	4 months	A child's arm	"Never ill before"	The face became a mass of sores. The doctor said that the child would go blind without great care. The eyes were bad for 12 years, and they are still red and without eyelashes.		The doctor said it was a case of blood poisoning and measles. The boy was ill two years in all.
44	Clay, J. A.	1861	3 months	"	"Quite healthy"; good eyes.	The vaccinated arm inflamed but no pock formed. The inflammation spread to the eyes, and the child became quite blind. He died blind 11 months after vaccination.		None of the other children have had eyes. This one was hindered in his schooling through his eyes being injured.
45	Carver, J.	About April 1873	"	"	"A fat healthy child"	A large mass of sores formed on the vaccinated arm, followed by bowel complaint, wasting, and death.		The doctor wanted to re-vaccinate him, but the mother objected as the inflammation was spreading.
46	Campbell, H.	July 1886	14 weeks	"	"A fine fat baby"	The arm became swollen, inflamed, and as hard as a stone. The teeth rotted out. The smell of the corruption was fearful.		The child was ill seven weeks, and literally wasted to death.
47	Collage, A.	Christmas, 1884	15 months	A glass tube	Quite well			Her mother postponed the vaccination as long as she could. The doctor attended the child free of charge. She ultimately recovered.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4.—continued.

The testimony of the parents.						
No.	Name.	Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.
48	Clarke, J. R.	December 1871	3 months	From a child	"Never a day's illness before"	The child had a fearful arm. Erysipelas supervened, spreading down to the wrist, then to the neck and the head. Water on the brain ensued, and he died, after three years' illness, blind.
49	Cater, A. J.	August 1881	4 months	From another child	"Fat and healthy"	After the operation "lumps" formed in both cheeks. Though lanced and healed, the health was so impaired that the child died after seven months' illness.
50	Clay, A.	April 1884	6 months	From a fine big child	"A strong healthy child before"	Erysipelas supervened in the vaccinated arm extending down to the fingers. Bowel complaint followed. The child wasted away and died.
51	Curral, T.	About June 1878	12 months	A child's arm	A very fine child before	The vaccinated arm was very bad a long time. The child became so much debilitated through vomiting and diarrhoea that it could not walk until over 5 years of age.
52	Cann, A. A.	1864	5 years	A healthy-looking child.	Quite healthy	Eruptive sores, like small-pox, came out all over the body after the arm had healed.
53	Cobson, A.	1872	18 months	From the child of a diseased family.	"As nice a child as you could meet with."	A bad arm resulted from the operation, and a head covered with sores. The child was never well after vaccination. She complained of headache continually, and died of "fever" after three years' illness.
54	Cowell, E. A.	1870	11 years	Unknown	Quite well	Erysipelas followed vaccination, and the child was ill for eight years. She is not thoroughly well yet.
55	Collin, S. A.	1874	6 weeks	A child's arm	"	Eruptive sores appeared all over the body. The child was ill for six months.
56	Clarke, S. T.	1881	About 9 months	"	"	A cancer formed at the back of the eye. The eye had to be taken out. The child was ill three years.
57	Collins (child of Mrs.)	June 15, 1859	About 5 weeks	"	"	Inflammation set in around the punctures, and extended all over the body. Death ensued.
58	Dixon, F.	August 1881	3 months	"	"	The body broke out all over in pimples, like measles, but so irritating that the child's hands had to be tied. He is still ailing.
59	Dodge, A.	1869	5 months	A country child	"	The operation was followed by inflammation from the elbow to the shoulder. As the arm recovered sores broke out on the head.
60	Dalby, T.	May 1883	3 months	A child's arm	"Finest baby of family"	The child became very quiet. A doctor was called in, but the child died the day after.*
61	Dalby, H.	September 1886	12 weeks	"	"A beautiful child"	The child had a "dreadful arm" for nine weeks. Head sores appeared. The body was reduced to a skeleton. He could not walk for three years.
						One of the other children in the same family was ill nine weeks after vaccination. See below (No. 61).
						The eruptions recur. This child was brother to the above (No. 60), which died from vaccination. The parents are healthy.
						The child was never well after its vaccination, and it died.
						The parents are healthy.
						The child was taken ill a week after vaccination. The parents healthy.
						The mother's little sister had a hole eaten through her arm after vaccination and she died. The father would go to gaol rather than have any more children vaccinated.
						The doctor called it "mumps," but as the father had a daughter which also died through vaccination he went to prison seven days for the next child rather than submit it to the operation.
						The parents had two or three doctors attending the child, but they could not save him.
						A doctor on seeing the child's state said it was owing to "the cursed vaccination."
						Four of the same family were made ill and blinded by small-pox, although they were all vaccinated in 1872. They recovered, but the youngest, Sarah, was ill six months.
						The parents healthy.

\* Eleven days after vaccination.—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4—continued.

No.	Name.	The testimony of the parents.					Effects produced.	Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.			
62	Drage, F. G.	July 1880	6 weeks	From tubes, by private practitioners.	“Both beautiful babies”		Eruptive sores broke out all over the body; and the child died 10 weeks after vaccination with large sores on her arm.	Parents both healthy. They believe that both these children were killed by vaccination.
63	Drage, M. G. and	Christmas, 1883	Do.				The face and neck became smothered with sores; as these disappeared she wasted away and died in 13 months.	
64	Deacon, M.	June 1880	About 9 months	From a child which died a few days after.	Well		The vaccinated arm was in a dreadful state; the upper part became a mass of sores. An abscess formed under the arm.	Parents healthy. The child recovered after six months' illness.
65	Daulby, W.	June 1879	7 months	From another child	“Could not have been healthier”		Erysipelas immediately followed the operation. It spread all over the body down to his toes. The nails came off. The child suffered much for six months. Members of the Board of Guardians came to see it.	The vaccinating doctor attended the child free of charge. A cousin of the child, which was vaccinated from it, suffered in a similar manner.
66	Day, M. W.	1882	3 months	From a fine boy	Healthy up to vaccination		The arm became much inflamed and, after recovering, all one side of the body became a mass of sores. She still suffers from occasional eruptions, and a lump under cheek.	The parents are healthy. The child was prevented from walking until 4 years of age.
67	Daft, E. E.	About May 1884	“	From a child whose grandfather had diet of abscesses.	“Never ailed anything before”		As the arm healed sores appeared on the back. Afterwards two abscesses formed in the face.	Abscesses were before unknown in the family. The parents would not have any more children vaccinated.
68	Doore, A. H.	About October 1876	“	A child's arm	Quite well		The child had a very bad arm, which was followed by sores on the head and ears. He was ill six months.	One of the family had small-pox directly after vaccination.
69	Deacon, S.	1876	About 4 months	“	“		After the operation the ears and face became covered with sores. He still suffers from occasional eruptions.	Parents healthy.
70	Drake, H. H.	August 1870	“	Not known	“		The vaccinated arm became inflamed and “every joint seemed like raw beef.” The ears discharged from a tumour. The boy frequently suffered from inflammation of the lungs during 12 years.	He is at present under treatment for deafness.
71	Ellmore, A. E.	September 1887	3 months	“	“		He suffered seriously after his vaccination.	Vaccinated by Dr. Wingate.
72	Emery, F. C.	September 1878	“	A child's arm	Well		Had a bad arm. An abscess formed in the right cheek, leaving a mark in the face. He was ill for several weeks.	Parents healthy. They had another child which died a fortnight after vaccination.
73	Eason, P.	About October 1881	About 4 months.	“	Quite well		The arm became very inflamed, and as hard as a stone. The child cried much, and suffered from diarrhoea. He cannot now retain the feces.	The mother has had eyes from vaccination. Three of the other children are all right.
74	Foreman, E.	1886	18 months	“	Eyes perfect		The vaccinated arm was bad for a month. Inflammation of the eyes followed. The child was ill 3½ years.	Another child in the family broke out all over the body in sores after his vaccination.
75	Foreman, C.	1887	4 years	“	Quite well		The eyes became very bad, continuing watery and inflamed for 28 years. They are still weak.	The eyes affected and still weak.
76	Foreman, E.	About February 1875	About 6 months	“	“A beautiful child”		Sores broke out immediately after the operation all over the face. The child was almost blinded. She was ill for eight months.	
77	Foster, J.	May 1870	6 months	A quill	Quite strong		The operation was followed with sickness and vomiting. The arm was like fire, with dreadful itching. The mother had to muffle the child's hands.	A sister to this child suffered from deafness after vaccination.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4—continued.

No.	Name.	The testimony of the parents.					Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.	
78	Flowers, E. A.	March 1881	4 months	A child's arm	"A nice child, but subject to 'fits.'"	The arm swelled to double the natural size, and had to be protected by a "cage." Three abscesses formed on the arm. The doctor took a tube full of matter from it, although the mother told him that the child was subject to fits. She was ill seven months.	Another child in the same family died the day after vaccination. The mother "pitched the vaccination officer out" at his next visit.
79	Ford, S.	February 1880	6 weeks	Vaccinated twice from tubes.	"A very fine healthy child"	After the second vaccination the arm became an "awful sight," red and full of sores. The finger nails came off. The child was ill nine months.	The doctor said it was a case of blood poisoning through vaccination.
80	Ford, E.	August 1882	10 weeks	A child's arm	Quite well	Erysipels followed on both arms and hands. Sores appeared on the face. The child was ill five months, and then died.	The doctor said that she died from "teething." The mother is now opposed to vaccination.
81	Findley, G. H.	About October 1868	3 months	Unknown	"Nothing amiss before"	Inflammation of the eyes followed the operation. He was taken to the infirmary, but the eyes are still bad at times.	The father would have no more vaccinated after this.
82	Fewkes, J. H.	1872	Over 6 months	"Does not know"	Well, excepting a cold	The vaccinated arm seemed to twist. Abscesses formed in the flesh. The child was ill seven years and then died, the lower part of one ear having rotted away. The parents could get no rest for its sufferings and cries.	This was a bad case. A doctor (whose name can be given) admitted the child was killed by vaccination. Many doctors saw it, and said the same.
83	Fisher, A. E.	December 1871	6 months	A tube	"Not a blemish on his body"	Pimples, inflammation, and sores came out on the arms, head, and body.	The child suffered for six months.
84	Fryer, L.	July 1871	11 months	A child's arm	Healthy and robust	The arm became swollen as thick as two arms. The child was dreadfully sick. Abscesses formed under the arm, and matter dropped from her elbow.	The doctor visited the child four times a day, and the parents thought that it would never recover. Well now (1890).
85	Flowers, L.	1876	About 3 months	"	Quite well	The vaccinated arm was unusually bad. Sores broke out all over the body. The head and eyes were very bad.	The parents believe that three of their children have been killed by vaccination, as they died within a fortnight after the operation, and were all healthy before it.
86	Flowers, E.	1873	3 months	A child's arm	Quite well before vaccination.	The arm became much inflamed. Running sores broke out all over the body. The child was a great sufferer. The ears were a mass of sores, with a dreadful smell. It died three months after vaccination.	Dr. D—— said that the death was due to vaccination.
87	Fearson, L.	About March 1881	About 3 months	"	Quite well	The four pustules formed one large hole, and the head was covered with sores.	
88	Fearn, E. A.	June 1879	"	"	"	The vaccinated arm was much inflamed. Abscesses formed on the thigh and the ankle. The eyes were affected, and the child was ill two years.	Dr. D—— advised piercing the ears to improve sight. The ears were pierced, but abscesses formed around the eyes.
89	Fox, V.	1869	9 months	"	"	The arm was much inflamed. A hole formed in the left side. The child died suddenly, soon after vaccination.	Parents healthy.
90	Goodrich, M. A.	May 1882	3 months	A child	"As healthy a child as ever 'breathed.'"	The neck became a mass of sores. The legs and feet were very bad. She could not wear either shoes or stockings, and screamed terribly. She is not yet quite well (1889).	The parents healthy.
91	Greet, L. M.	August 1871	8 months	A tube	"A nice little fleshy child"	The child fell into a rapid decline, and died in two months, the medical certificate giving "decline and exhaustion" as the cause of death.	The doctor said that the vaccine lymph had been "too strong for the child." The parents are healthy.
92	Gooder, F. A.	October 1878	6 months	A child's arm	Well	The vaccinated arm became red and swollen, and an abscess formed under it as large as a hen's egg.	



(Papers handed in by Mr. John Thomas Biggs.)

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TABLE 4—continued.

No.	Name.	The testimony of the parents.					
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.	Remarks.
93	Gilbert, L.	May 1868	3 months	A child's arm	"Right before the operation"	An abscess formed under the arm, and became a sloughing sore. The eyes were inflamed with a watery humour, and are not yet right (1889).	Two other children of the same family were ill after vaccination. The parents are healthy.
94	Griffiths, P.	June 1881	"	A tube	"A beautiful child"	This child entirely lost the use of the vaccinated arm. Mortification set in inwardly, and death resulted in about 19 days.	Both parents "feel certain it was killed by vaccination." It was vaccinated by a private practitioner.
95	Gibson, E.	November 1883	2 months	A child	As well as possible	The vaccinated arm became swollen, hard and inflamed. This was followed by scurvy in the gums, which are not yet right (1889).	The doctor said that he did not inquire about the "matter," when not paid a fee. Another child in the same family had scurvy after vaccination. The parents are healthy and free from scurvy in both families.
96	Gamble, J.	About April 1859	3 or 4 months	"	"As strong a child as ever was seen."	Sores like boils broke out on the child's cheek. As these healed a patch as large as the hand came out on the thigh. He suffered much for two years.	One of the family had a bad leg after his vaccination.
97	Gardner, C. E.	December 1887	9 months	A glass tube	Not strong, but skin clear	After the operation eruptions appeared all over the head and face. She was blind for some weeks.	She was taken to the Eye Hospital, but the eyes are not right yet (1889).
98	Greenwood, J. A.	June 1875	3 months	A child	Quite healthy before	The vaccinated arm became inflamed and swollen. It was bad nearly three months; then the eyes were affected, and they are still bad (1889).	The parents have taken the child to different eye institutions. The child is now (1896) under treatment at Nottingham.
99	Gunby, R. A. J.	Early in 1880	5 or 6 months	A child's arm	"Not a nicer babe anywhere."	The parents never saw so bad an arm. They had no sleep at nights on account of the child's sufferings. The face became a mass of scabs. Periodical eruptions came out for seven or eight years.	A doctor said that it was caused by vaccination. The father would have "no more of his children done." His brother went to prison for the non-vaccination of his child.
100	Goodman, H.	1875	3 months	"	Quite well	Large holes were eaten by the disease in the vaccinated arm. An abscess came in the neck. She suffered up to 10 years of age.	Parents healthy.
101	Graves, T.	"	16 months	From the calf	"	The child was taken ill soon after vaccination and suffered severely. She is not well yet (1889).	The doctor said it was through vaccination. The father says he "would go to prison rather than have another child vaccinated."
102	Halford, F.	June 1882	3 months	A child's arm	"	The vaccinated arm became much inflamed, and "smelled fearfully." Three abscesses successively formed, and the child was ill three years.	The father declares that he "will never have another vaccinated."
103	Hogg, F.	July 1883	6 months	A child in a family subject to fits.	"	The arm was bad three months, and the child became helpless. At nine months she began to have fits. She is still helpless.	
104	Hunt, E.	April 1876	"	A child's arm	"A beautiful fat baby"	"A dreadfully cruel arm" resulted. Wet, green sores formed; and the child died three weeks after vaccination. Certified cause of death not known.	The mother took the child to a doctor, who, on seeing its arm, said: "Poor child, cover its arm; it is from vaccination."
105	Hobbs, V.	Christmas, 1887	About 10 weeks	"	"Never had a spot on her before."	Erysipelas supervened affecting the whole arm, which became a mass of sores. Four strawberry-like formations protruded from the pustules.	There was no rest at night for the child or the mother, who thought that the child would die, but "it pulled through."
106	Harcourt, E.	About October 1871	About 4 months "under compulsion."	A neighbour's healthy looking child.	Quite well	"A cruel arm" resulted, followed by inflammation from the shoulder to the fingers. As the arm improved the eyes grew weak, corrupt matter oozing out of them. She lost her eye lashes.	Three other children vaccinated from the same source all died. The mother of this child would "have no more vaccinated."



(Papers handed in by Mr. John Thomas Biggs.)

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TABLE 4—continued.

No.	Name.	The testimony of the parents.					Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.	
107	Hubbard, A.	About May 1880	9 months (not wanting it vaccinated).	A child's arm	Quite well	The child sickened, and began with diarrhoea. It wasted away and died six weeks after vaccination.	The death certificate was "Consumption of the bowels and diarrhoea." The mother would have no more children vaccinated. Her sister lost two after the operation.
108	Heggs, L.	August 1878	9 months	A tube	"Fat and well, but had a cold at the time."	The vaccinated arm became swollen, shiny, and fiery. One might see his face in it. The parents could get no rest for the cries of the child, which wasted almost to a skeleton through diarrhoea.	Still very delicate (1889).
109	Holt, R.	February 1871	3 months	A child's arm	"A hearty and healthy child."	Inflammation set in in the vaccinated arm, followed by eruptions and sores, which recurred for seven years. The child became dull, quiet, and lame. Bones came out of some of the sores.	She died from "scrofula," at 14 years of age. The doctor attending the child said that her sufferings were "Caused by vaccination."
110	Hand, H. H.	Revaccinated 1872	Vaccinated at 6 weeks old and revaccinated at 18 years of age.	Lymph supplied by a private practitioner.	Quite well	After revaccination the arm became much swollen, red, and purple. A mass of sores broke out on the arm and shoulder. The child was ill six or seven weeks.	The doctor under whose treatment she was placed said he was "afraid it was vaccination."
111	Howe, H.	1885	3 months	From a healthy-looking child.	"Nothing ailed him before"	The arm was much inflamed down to the wrist, the sores remaining a long time. The child died in a fit at eight months old.	None of the family have ever been known to have scurvy.
112	Hammell, R.	August 1888	3 months	A child	"Not a clearer-skinned child anywhere."	The operation caused inflammation of the arm down to the wrist. Measles followed, then scurvy came in the back of his head.	The child looked so healthy that the doctor took a large quantity of matter from his arm with which to vaccinate others.
113	Halford, W.	February 1868	About 3 months	"	"Not a nicer child to be seen"	The vaccinated arm, and the face and head, became covered with sores. "Lumps" formed under the arm, and on the back of the head. He is not well yet.	Parents healthy.
114	Hartshorn, L.	About April 1884	About 6 months	"	Quite well	The child's health declined after vaccination, and abscesses formed under the vaccinated arm about two years after the operation.	Two other children of the same family died from fits, brought on, the parents believe, by vaccination.
115	Halliday P.	About March 1886	About 12 months	Not stated	"	The arm was bad from the shoulder to the elbow. The eyes became affected, and they cannot now bear the light. She has never been well since.	Parents healthy.
116	Hefford, T. W.	1874	3 months	A child's arm	"	He suffered from fits after vaccination	Parents healthy.
117	Hennessey, E.	July 1880	9 months	"	Quite healthy	A "lump," the size of a hen's egg, formed on the head after the operation.	Parents healthy.
118	Inglis, E.	1875	6 months	A child's arm	"Never ailed anything before."	The child had "an awful bad arm." Ulcers formed. The head and feet broke out with sores. The corruption was fearful, and a great hole formed in one ankle. She became subject to fits, and died 12 months after vaccination.	A doctor told the mother that the child was "killed by vaccination."
119	Idiens, G.	1877	About 6 months	"	Quite well	This child became one mass of sores all over his body. He was very ill for six months.	Parents healthy.
120	Johnson, T. W.	April 1887	4 months	"	Not quite well	He became insensible. Erysipelas spread from the arm to the chest; abscesses formed in the arm, and the child drooped and died about a month after vaccination.	The rest of the children are unvaccinated and well.
121	Jones, W.	Revaccinated by the army doctor at D—, at about 18 years of age, in 1875.		Not stated	"Never had fits before his revaccination."	This young man had a very bad arm, and after the operation he became subject to fits, to which he is still liable, much to his detriment.	None of the family ever suffered before from fits. One died a mass of sores three months after vaccination. The parents are healthy.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4—continued.

No.	Name.	The testimony of the parents.					Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.	
122	Johnson, F. L.	February 1871	4 months	A tube	"As clear as possible"	Dreadful eruptions came out all over the head and the body. The skin and hair came off "like a horrible skull cap." The child could not be dressed for two years. She is still subject to sores, and frequently under medical treatment.	The parents and nine other children quite well.
123	Johnson, E.	About November 1870	3 months	Not stated	Well	The eyes became dull and sightless. She has been under four doctors. The eyes are not strong yet (1890), although improving.	The parents and the other children are healthy.
124	Johnson, A.	1882	9 years	A child's arm	Quite well	The body became covered with eruptive sores from head to foot. He suffers yet, and is often under the doctor.	The parents and the rest of the family are healthy.
125	James, S. A.	-	As a baby	"	"	The vaccinated arm was much inflamed, and sores appeared on the head, which is still subject to eruptions.	The doctor called it "erysipelas."
126	Kidger, T.	November 1885	Nearly 3 months	A glass tube	"As healthy a child as ever lived."	Erysipelas supervened, affecting the whole arm down to the wrist. An abscess as large as an egg formed under the vaccinated arm.	The mother has since removed about from place to place to avoid having other children vaccinated.
127	Kennedy, A.	February 1874	6 weeks in the army	"	Well before	Vomiting and diarrhoea followed the operation, causing the child to pine away and die, after 18 months' illness.	Nothing of the kind was ever in the family before.
128	Kitchenman, W.	October 1879	19 months	A child's arm	"As fair as a lily before"	Erysipelas at once set in down the arm, then around the body down to the toes. Three abscesses formed, and "the smell was dreadful."	Parents and other children all healthy.
129	Knight, W.	January 1881	3 months	"	Quite well	The vaccinated arm was inflamed and swollen, and the head became affected. The left ear is constantly discharging.	The doctor said it was erysipelas he began with, but "bronchitis" was put in the death certificate.
130	Limb, M.	1881	6 months	A glass tube	"Not strong, but well when vaccinated."	Erysipelas set in, an abscess formed under the arm, bronchitis followed, and the child died five months after vaccination.	An inquest was held over the child's death, but no account of it was seen in the newspapers.
131	Lydall, S.	April 1878	3 months	From a child whose mother had a bad leg.	Quite well	The vaccinated arm seemed to get well, but 2½ years afterwards it began suddenly to swell where it was vaccinated. The child was taken to the infirmary, and died two days after. On opening the vaccinated arm the bone was found to have rotted away and poisoned the blood.	Parents healthy.
132	Lester, W.	1869	3 months	A child's arm	"	The child began to be ill directly after the operation. A rash came on the face and the head. He had convulsive fits and died.	Father and mother healthy.
133	Lemon, A. E.	January 1863	6 months	"	"	Spots appeared on the body, and the hand became a mass of running sores. The thumb had to be amputated, and the face was badly disfigured.	The parents and the rest of the family are healthy.
134	Lumb, B.	-	About 4 months	"A bottle"	"	The vaccinated arm became very much inflamed, and the child was a great sufferer.	Now dead; cause not stated
135	Ledger, E. J.	1879	3 months	A child's arm	"	The arm was much swollen, and the child afterwards became weak and languid.	
136	Ledger, J.	1877	About 3 months	"	"	Always crying after being vaccinated*.	

\* This child was always ill and crying after being vaccinated.—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4.—continued.

No.	Name.	The testimony of the parents.					Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.	
137	Iee, J. A.	April 1885	3 months	A child's arm	Quite well	The eyes were injured through the vaccination, and the child was an out-patient at the hospital for several months.	Parents and other children healthy.
138	Look, W.	September 1870	About 4 months	"A bottle"	"	The arm inflamed in botches. Sores broke out all over the head. The eyesight was injured. The child died, never recovering from the shock.	The sight was so much injured that the child did not even recognise its mother, except by her voice.
139	Matthews, E.	1886	About 3 months	A child's arm	"	After the operation a watery humour oozed from the arm and the neck. Bovel complaint followed, and the child "dwindled away and died."	Parents healthy.
140	Moore, E.	1884	5 months	A glass tube	Quite healthy	The vaccinated arm became badly inflamed down to the hand. She had to wear a "shield," and was ill 23 weeks.	The mother told the doctor he had put bad matter into the child's arm. He ordered her out of the surgery.
141	Mann, W.	August 1886	12 months	A child's arm	"Nothing the matter before"	Within a week after vaccination sores broke out on the arm and body. The child became very weak. The left eye began to inflame, and it still festers.	None of the other children in the family have bad eyes. The mother fearing vaccination had put it off as long as she could.
142	Marim, E.	About August 1864	3 months	"Matter" the doctor had by him.	"Certainly well"	After the operation the arm became purple and swollen, down to the fingers. The mouth was inoculated, and the child wasted to a mere skeleton and died.	At death his bones appeared as if only covered with paper.
143	Manship, F.	About September 1870	3 months	A child's arm	A nice baby	The arm was covered with sores above the elbow, and inflamed below it. Sores appeared on the head and the body. She wasted away until the bones protruded, and died 10 months after the operation.	Although the child carried the vaccination wounds to the grave, "consumption" only was put on the death certificate.
144	Martin, A.	About July 1885	3 months	"	Quite well	Sores appeared all over the body, and abscesses formed under the arms and groins. The scalp came off, and it was feared his legs would rot off.	The child suffered for many months. The parents are healthy.
145	Mann, C. L.	About Christmas 1864	3 or 4 months	"	"	A very bad arm resulted from the operation, and "big blebs" came on it. As these were dried by the doctor's remedies scabs broke out on the head. The eruptions recurred annually for 14 years.	After this case the mother removed about from place to place to avoid the vaccination officer.
146	Musson, M. A.	September 1885	15 months	"	"	The vaccinated arm was swollen and inflamed. Two abscesses formed under it, and one behind the ear. After four years' illness the child died.	The parents are convinced that vaccination was the cause of the child's death.
147	Marples, H.	About end of 1881	4 months	"	Quite healthy	The arm broke out all over with sores. The child was ailing more or less for five years.	Parents and the other children healthy.
148	Marlow, F.	September 1882	About 3 months	"	Quite well	The arm was much inflamed. The eyes were affected, and the child blind more than a week. Her health was impaired, and death followed.	The parents are healthy.
149	Maxfield, S.	1881	7 years	"	"	After vaccination the body became covered with sores, and the child is still troubled with eruptions.	The parents are healthy, and the other children are all well.
150	Marvin, W.	About December 1883	About 3 months	A child's arm	"	After the operation large holes formed in the arm. The neck was very much discoloured, while the ears "seemed as if they would rot off."	The parents and the other children of the family are healthy.
151	Murgatroyd, L.	January 1877	"	"	"	Eruptions broke out all over the child. The body had to be wrapped up carefully for two years, and the hands were bandaged for nearly seven years.	The child has never been well since the operation. Its face is covered with "botches" now (1889). The parents are healthy.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 4—continued.

No.	Name.	The testimony of the parents.					Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.	
152	Milbourne, J.	1884	-	Unknown	"A very fine child"	Erysipelas supervened, extending to neck, head, and all over the body. He died in a fortnight.	The doctor who was called in said that the child would have been still living but for vaccination. The coroner declined to hold an inquest.
153	Mortimer, B.	1880	About 8 months	A tube	Quite well	The head became covered with a mass of sores, the eruptions spreading to the shoulders, back, and body.	The child suffered for six years, and is not strong yet.
154	Norman, A.	1867	3 months	A child's arm, the father of which had a "nasty complaint."	"A beautiful child"	Sores broke out on the body, and abscesses formed in the cheek. She was ill about 20 months and then died, the certificate giving "scrofula" as the cause of death.	The doctor told the mother it was "through vaccination," but that she had "picked her own child" to have the matter from.
155	North, J. T.	May 1866	"	A child's arm	A fine child	The vaccinated arm became inflamed and hard underneath. The eyes were bad, and continued for some time weak and watery.	
156	Neal, J.	October 1882	9 weeks	A tube	Quite healthy	The arm "did not take," but the child became inwardly ill, and rapidly declining, it had a fit and died 10 days after vaccination. An inquest was held, and the verdict given was, "Had a fit and too weak to rally," nothing being said as to the cause of the fit.	The doctor's assistant said that the child was "killed by the vaccine poison." The mother had one child blind for six weeks after the operation. On her refusing to have another child vaccinated, the magistrates allowed this plea and dismissed the summons.
157	Neal, E.	About December 1882	15 months	A child's arm	Quite well before	The arm bled when it was vaccinated. The mother begged the doctor not to take any matter from the arm as the child was poorly after the operation. He, however, took the matter, and the child grew rapidly worse, and died within a week.	The mother having a dread of vaccination had deferred it for 15 months.
158	Nowell, G.	About August 1878	8 months	"	Quite well	After vaccination sores broke out all over the body	Parents and the other children of the family healthy.
159	Pegg, M.	August 8th, 1858	"	"	"Quite well before vaccination."	She became a complete mass of sores all over the body from head to foot, and had small-pox. She died on August 21st, a fortnight after the operation.	Vaccinated by Dr. Nuttall.
160	Potterton, J.	January	-	The arm of a child which had erysipelas, and afterwards abscesses.	Well	The day after vaccination he began with erysipelas, and became very ill. He has "been at death's door ever since."	Being put to serious trouble and expense, the father appealed to the guardians to pay his doctor's bill, but no notice was taken of his letter.
161	Pollard, E.	September 1881	3 months	A child's arm	"A beautiful child"	A dreadful arm resulted from the operation, with sores discharging for over two months. A red rash appeared on the body, recurring annually.	Two other children in the family are perfectly free from spots. Parents healthy.
162	Peach, T.	" 1874	12 months	"	"Well and walking"	After the operation an abscess formed under each arm. The stench was "something fearful." The child became so weak that it could not walk again for four years.	Parents healthy, and have nine healthy children living.
163	Palmer, K.	January 1886	3 months	A child's arm	Quite well	The vaccinated sores kept open for two months, and were followed by water on the brain. The child was unable to walk, and was an outdoor patient at the infirmary for two years.	The other children are well.
164	Perkins, W.	February 1874	"	A tube	"	The arm recovered, but the child was never well afterwards. He died in fits.	He was the only child lost out of seven. He was vaccinated by a private practitioner.
165	Proctor, C.	1872	3 to 6 months	"	"A fine healthy child"	The arm was bad from the shoulder to the hand, and the child had palpitation of the heart and fits.	The heart is still weak. Parents healthy, and four other children living and well.

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(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4—continued.

No.	Name.	The testimony of the parents.					Effects produced.	Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.			
166	Payne, J. E.	Christmas, 1872	2 to 3 months	A child's arm. 5 places	Quite well	-	The arm was vaccinated in five places, and became much inflamed. Sores appeared on the head and the body, recurring every spring and autumn for 15 years.	Parents healthy. Another child afterwards vaccinated suffered like this. ( <i>See</i> below, No. 167.)
167	Payne, M. J.	October 1868	3 months	A child's arm	All right	-	The arm became very sore and swollen. A "lump" formed under it, which broke and discharged. Pocks, as large as the first, formed on the arm all the way down to the hand.	<i>See</i> above, No. 166. The parents feared that this child would lose her arm. It is still weaker and thinner than the other arm. There are seven other children living and well.
168	Pentrell, F.	May 1878	4 months	"	"A fine plump baby"	-	Eruptions appeared all over the body, alternately healing and breaking out. She died after five months' illness, the nails and the eyes turning purple.	Parents healthy.
169	Pegg, G.	1840	9 years	Not stated	Quite well	-	After the operation abscesses formed in the neck, chin, and gullet. Although the child was under two doctors the abscesses kept running for five years.	No complaint of this kind ever before appeared in the family.
170	Peasnell, M. A.	Re-vaccinated at 15 years of age in 1880	-	From a healthy looking child.	"Perfectly well"	-	After re-vaccination the arm was red, swollen, and shiny. From the shoulder to the fingers, and very painful. Abscesses formed. A little scurvy still remains about the left ear.	Re-vaccinated at a factory in Nottingham. The "hands" were forced to submit to the operation or else to lose their work.
171	Parsons, J. P.	Christmas, 1879	9 months	A child's arm	Quite well	-	After the operation the arm became raw, and matter oozed from the sores every night. The child's health gave way, and he died after nine months' illness.	The mother "would never have another child vaccinated."
172	Pooley, E.	May 1884	3 months	"	"	-	The arm was inflamed and swollen. It grew worse after "matter" was taken from it to vaccinate other children. The flesh seemed to be eaten away, and the smell was fearful.	Another child vaccinated from the same source suffered in a similar manner. A doctor said that it was "through vaccination."
173	Pratt, E.	-	6 months	"	"	-	After vaccination she broke out with eruptive sores all over the body and died.	Parents healthy. Certificate of death unknown.
174	Priest, H.	-	9 months	"	"	-	A "bad arm" resulted from the operation, and running sores appeared on the head and the body.	One of the family took small-pox directly after vaccination.
175	Price, —	-	3 months	Unknown	Not stated	-	This child became blind and helpless after vaccination, and was ill until its death at 13 years of age.	Father and mother healthy.
176	Page, S.	About January 1870	About 4 months	A child's arm	Quite well	-	The vaccinated arm became swollen and inflamed; and the child was in great pain for several weeks.	A doctor said that the illness was caused by vaccination. The father afterwards felt very bitter against vaccination.
177	Russell, A.	October 1879	About 5 or 6 months.	From a child whose father was found to have a "bad" disorder.	"	-	After vaccination eruptive sores appeared on the back, shoulders, neck, and head, recurring annually for 12 years. The parents had to cut her hair off, and rub the sores with precipitate ointment. There was a nasty smell with the sores.	Parents healthy. They would never have any more children vaccinated.
178	Russell, A. J.	February 1871	4 months	A child's arm	"A nice strong baby"	-	Inflammation, erysipelas, and bronchitis followed the operation. The child became so weak he could not walk until four years of age.	The mother removed two or three times to avoid the vaccination officer.
179	Rodwell, G. H.	November 1886	3 months	A healthy looking child.	Quite well	-	Erysipelas supervened from the shoulder to the wrist, then eruptions appeared on the body "like boils." Vomiting and purging succeeded, until the child wasted away and died a skeleton.	



*Papers handed in by Mr. John Thomas Biggs.)*

App. No. 3

The testimony of the parents.							Remarks.
No.	Name.	Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.	
180	Robinson, K.	1886	About 5 years, being opposed to vaccination.	Not known	"Right before vaccination"	The arm was much inflamed, and became subject to sudden twitches. The eyes afterwards were affected, and became too weak to bear the light.	The child's brother had an abscess after vaccination. Its uncle went to prison seven days rather than have his child vaccinated.
181	Eddington, E.	July 1880	7 months	"	Quite well	The body broke out all over in sores directly after the operation.	Parents healthy.
182	Bodwell	1879	9 months	Not given	"	Eruptive sores appeared all over the body. The child's hair all came off. He still suffers though now 12 years of age (1889).	
183	Rudkin, R. W.	About August 1875	About 3 months	Not stated	"	After vaccination a rash broke out, and the child continues to suffer from frequent eruptions.	Father, mother, and other children healthy.
184	Spencer, C.	About September 1870	9 months	A child's arm	Well, but not strong	Soon after the operation a large abscess formed behind the ear, which, when lanced, yielded a tea-cup full of dirty black matter.	Parents healthy. They had one child which died at nine years of age from small-pox, although vaccinated in infancy. It died after five or six weeks' illness, during which it became blind.
185	Seal, H.	January 1879	4 months	A healthy child	Quite well	Running sores broke out on the arm, wrist, head, and feet. The child was ill five or six months.	Parents healthy.
186	Stretton, J. W.	About June 1879	7 months	A child's arm	"A fine fat boy"	Eruptive sores appeared on the mouth, nose, and back. The child wasted away in nine months.	Parents strong.
187	Smith, W. J.	1876	6 to 8 months	Unknown	Quite well	Inflammation of the arm resulted. Sores appeared on the head, fingers, and toes. The child was ill three months. It died at 2½ years of age from "diarrhoea."	The parents have since rejected vaccination for other children, and have been twice fined by the magistrates.
188	Smith, B.	April 1876	6 weeks	A child's arm	"A fine fat baby"	After the vaccination a "lump" formed in the neck which grew as large as the child's head. When it burst half a gallon of dirty matter came out. His eyelashes were destroyed.	The child is not yet quite well (1889).
189	Spriggs, P.	April 1885	2 to 3 months	"A glass"	Quite well	Erysipelas resulted down to the finger ends. The child suffered much. The mother could obtain no rest at night for its sufferings. It was ill nearly three months.	Parents healthy.
190	Skelson, W.	January 1884	3 months	Another child	"	Eruptive sores appeared on various parts of the body. Since his vaccination the child has never been long free from sores.	
191	Sheppard, L.	September 1886	6 months	"	"A fine fat baby"	The four pocks formed one sore. The arm was bad three months. Inflammation and whooping cough followed, with wasting of the body. The child died after 16 months' illness.	The medical certificate gave "Whooping" as the cause of death. The child's "bones" might have been counted, she was so wasted.
192	Spencer, E.	About June 874	Nearly 6 months	From a fine-looking child.	"Not a nicer child to be seen"	The vaccination resulted in inflammation and swelling in the arm, followed by sores on the arm, nose, and face. The nose threatened to rot off. After three years' suffering the child died almost raging mad.	She made her mother ill by inoculation, and the father ill with the awful stench arising from the sores. One doctor attributed it vaccination.
193	Southam, G.	October 1876	3 weeks	Not known	"As healthy and strong as could be."	Sores appeared on the vaccinated arm, alternately healing and breaking out. An abscess formed under the arm. The child was frequently vomiting. Fits came on, in one of which it died.	Parents healthy. They have four other children healthy and unvaccinated.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4—continued.

No.	Name.	The testimony of the parents.						Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.		
194	Scotton, F.	November 1883	7 weeks	A child's arm	"A beautiful baby"	Eruptive sores came out on and under the arm and on the chest. Bronchitis followed. The child is still weakly.	Parents healthy.	
195	Smith, H.	About March 1875	5 months	"	"Well before vaccination"	The pocks never healed. The arm shrivelled away almost to the bone. The child fell into a rapid decline, and died in six weeks. The medical certificate gave "Consumption" as the cause of death.	Another child (F. W. S.), of the same parents, had small-pox the week after its vaccination. Two other children in the same family died of consumption caused by vaccination.	
196	Smith, A.	June 1871	10 months; delayed on account of the parents fearing vaccination.	"	Well before	After the operation erysipelas appeared on the arm, then on the head and face. The child became a pitiable sight, as the flesh was eaten off her cheeks to the bone. She died a fearful object.	The death was attributed to "Devouring Wolf," caused (so the doctor said) by vaccination, as the grandfather of the child from which the lymph was taken died of the same disease. Sixteen doctors visited her; nine of them said her death was owing to vaccination.	
197	Shaw, M.	1876	3 months	"	Well	After the operation eruptive sores broke out on the body from head to foot, the child never recovering.		
198	Stevenson, W.	June 1878	4 months	A neighbour's healthy-looking child.	Not stated	After the matter was taken out the four vesicles merged into one large raw wound, 2 inches by 1½ inches, and ¾ inch deep, causing intense agony, and many sleepless nights.	The doctor used a kind of "pricking machine" with which to make the punctures.	
199	Skerritt, M.	May 1888	-	Not stated	"	The arm inflamed the day after vaccination, and then it became one mass of disease from the shoulder to the fingers. The child's life was threatened for a time. She is still delicate.	Dr. C. pronounced it to be a very serious case of erysipelas, and gave very little hope of recovery.	
200	Simpson, F.	-	-	"	"	Eruptive sores broke out all over the body. The child grew worse and was ill from the time of her vaccination until death.		
201	Simpson, J.	1879	4 months	A child's arm	Quite well	After vaccination very bad sores broke out on the arm and the feet. The health was injured; and, at the age of one year and ten months, the child died of bronchitis and whooping cough.	Vaccinated by Doctor R—.	
202	Sowerbutts, H.	April 1876	About 3 months	Not stated	"	The arm became very much inflamed and swollen. The eyesight was affected. The child was ill more than four years.	The doctor said that the nerve of the eye had been weakened.	
203	Sowerbutts, F.	February 1856	"	A child's arm	"	The vaccinated arm was much swollen. The child became very delicate afterwards, and eventually died of small-pox.	Two doctors attended it. The death certificate was "Small-pox."	
204	Shelton, J.	February 1876	About 7 months	Not stated	"	After the operation the top of the head became covered with sores. The child was never well again.	Parents healthy.	
205	Taylor, S.	1869	As a baby	A child's arm	"	Lumps as large as eggs formed under the vaccinated arm. The child was very ill for twelve months. Eruptions still break out annually.	Parents healthy.	
206	Torr, A.	About September 1892	7 weeks	From the calf	"Never ill before"	The chin, mouth, feet, and fingers were affected, and a dirty kind of matter oozed from them. The parents thought it was "a sort of foot-and-mouth disease."	Parents healthy.	

\* They attributed the peculiarity of the child's sufferings to the fact that it was vaccinated from the calf.—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4.—continued.

No.	Name.	The testimony of the parents.					Effects produced.	Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.			
207	Taylor, A.	Winter of 1877	14 months. (Mother not liking vaccination.)	Not known	"As lively a child as ever was seen."	The arm grew red and inflamed. The child became inwardly bad, and died in 14 days, before the arm recovered from the effects of vaccination.	The certificate of death was "Bronchitis and inflammation." The parents afterwards removed from place to place to avoid the vaccination officer.	
208	Thornwell, C.	1862	About 5 months	From matter which the doctor had by him.	"As nice a baby as ever was born."	The vaccinated arm became covered with sores like small-pox; then a rash came out all over the body. He suffered annually for 22 years, and when married his wife was affected with the disease.	A doctor said that he had been vaccinated with "bad matter."	
209	Timson, J. T.	January 1871	10 months	From a child (by private practitioner to secure "good matter").	"A fine boy"	The arm was bad, blood and matter running from it. The smell was fearful. Then the head became covered with sores, and abscesses formed. He suffered about 12 years.	Two doctors said it was through vaccination. The parents lost one child two months after the operation. They have six unvaccinated children all healthy.	
210	Truebody, H.	1885	11 or 12 months	A child's arm	"Could run about quite well"	The body of the child broke out in red spots all over. The ankles became swollen, and he lost the power to walk. As the feet improved he became blind of both eyes.	He was under a doctor's treatment for four years, but he has only recovered the sight of one eye.	
211	Timson, E. H.	March 1873	6 months	"	Quite well	A red streak appeared from the arm to the neck. Fits came on, and the child died within two months after the operation.	The parents have now six other children living, all healthy, and unvaccinated.	
212	Tyler, W. H.	About April 1882	4 months	Not stated	"	Eruptive sores broke out all over the body. The child was ill for more than seven years.	Parents healthy. Their other children all well.	
213	Thames, A. M.	-	-	Matter from London	-	The child was never well after vaccination, and ultimately died.	The doctor said that death resulted from vaccination, but he was sure that the matter was "good" as it came from London.	
214	Taylor, A.	About March 1878	5 months	Privately vaccinated. Source of lymph not known.	Quite well	After the operation the child's body was covered with sores for two years. The eyes were bad eight or nine months, the vaccinated arm being bad three months.	The mother declared that she herself would "go to gaol rather than have another vaccinated." She paid 3s. to have this child vaccinated with "good lymph."	
215	Taylor, —.	-	In infancy	Not given	Good	This child suffered for several years from the effects of its vaccination.	—	
216	Thomas, W. H.	October 1882	5 months	Arm-to-arm	"Well before the operation"	Large scabs and an open wound came on the vaccinated arm, the sores spreading all over the body. The child was never rid of them, but died from the effects of its vaccination.	The medical certificate was "Whooping cough and measles."	
217	Trueman, G. E.	June 1886	10 months	A child's arm	Quite well	After the vaccination the child suffered inwardly, and was in great pain until death. She died of convulsions brought on by the operation.	The medical certificate gave "Convulsions through vaccination," as the cause of death.	
218	Upton, C.	About March 1862	3 or 4 months	"	A fine child	Inflammation ensued, passing from the arm up into her face. The eyes were bad a long time, being fastened up with matter.	The father afterwards declared that he would "never have any more vaccinated."	
219	Underwood, A.	September 1887	4 months, about	Not stated	"Strong and healthy"	After vaccination eruptions broke out on her neck and arm. She was ill about five months.	—	



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4—continued.

No.	Name.	The testimony of the parents.						Remarks.
		Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.		
220	Underwood, G.	September 1885	5 months	Not stated	"Strong and healthy"	The vaccine pustules resulted in a hole the size of a 5s. piece, so that the arm-bone could be seen. The child was reduced to a mere skeleton, and was ill 18 months.	A large hollow scar still remains on the arm.	
221	Vincent, T.	January 1874	3 months	A child's arm	Good health	Large sores formed on the vaccinated arm, leaving deep holes. The child was in great pain. The mother and the child often cried together.	Parents healthy.	
222	Veasey, A.	October 1877	"	From a glass (by private practitioner).	A healthy child	Erysipelas supervened, the arm becoming purple. It spread across the breast and back, and went down the arm to the fingers.	One of the other children of the same family had convulsions after vaccination.	
223	Varman, M. A.	About March 1872	3 or 4 months	Not stated	"Healthy, like the rest of the family."	Sores as large as shillings broke out on the vaccinated arm and on the body. An abscess came under the arm. Eruptions recur annually.	She will probably never get quite rid of the effects of the vaccination.	
224	Veasey, E.	September 1877	About 3 months	A child's arm	A very fine child	The arm was very bad. An abscess formed, burst, and discharged foul matter. The child wasted away and died in three months.		
225	Vann, F.	About August 1875	About 5 months	Not stated	Quite well	The vaccinated arm was bad from elbow to shoulder. The child suffered much up to 12 months old, and frequently for seven years. He still ails occasionally.	The father's health generally good; the mother's health indifferent. They have other children all healthy.	
226	Wootton, A.	July 1879	6 months	A child's arm	A fine child	The arm became very much swollen and inflamed. The parents could get no rest day or night. He died with the arm bandaged up, after six weeks' illness.	A second doctor called in said that death resulted from vaccination.	
227	Walker, P.	July 1877	3 months	Not from the arm direct.	Quite well	The vaccinated arm was inflamed and swollen. An abscess formed under it, and general weakness followed.	All the family excepting this one are quite well.	
228	Ward, A. S.	January 1884	12 months	A child's arm	"Rather weak, but healthy at the time."	Through the running of the vaccination sores the arm became inoculated all round. Diarrhoea followed; and after six months' illness he died.	The death certificate was "Pneumonia." The child from which he was vaccinated died first, and a sister's child vaccinated from it died of dropsy five weeks after.	
229	Woodhead, W.	January 1882	9 weeks	"	A fine baby	Cicatrices healed. Arm then became red raw, the erysipelas going down to the fingers.*	The mother cried over it, and threatened to shoot the doctor if the child died.	
230	Wheeler, A. M.	December 1883	3 months	"	"A beautiful and healthy child."	As the arm healed eruptions appeared on the body, and as these went away a large abscess, size of a duck's egg, formed under the vaccinated arm.	The other children are well, and the parents would not allow them to be vaccinated on any account.	
231	Watson, A.	About April 1864	Under 3 months	"	Perfectly well	A mass of corruption broke out, first on the vaccinated arm and then on the head. Scabs came off in great cakes. The parents "had a horrible job with her." Several doctors attended her, but she died a skeleton after 18 months' illness.	The infirmity doctors acknowledged it was through vaccination. The smell was so dreadful it made another child ill, which also died.	

\* The cicatrices healed, but the vaccinated arm immediately afterwards became red raw, erysipelas supervening. It spread down to the fingers.—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 4—continued.

The testimony of the parents.						
No.	Name.	Date of Vaccination.	Age at Vaccination.	Source of Lymph.	Previous Health.	Effects produced.
232	Walpole, C.	December 1882	14 weeks	A child's arm	"Had a cough at the time"	The arm was much inflamed. The cough grew worse, and was accompanied with vomiting. The child died in a month with the vaccinated arm still bad.
233	Wilford, M.	1877	15 weeks	"	Perfectly well	The arm was very bad. Abscesses formed. The head too was very bad, and the sight became impaired.
234	Walker, C.	1881	"	"	Quite well	The vaccinated arm and the shoulder became swollen and inflamed. The inflammation went all over the body, and the child died.
235	Wilkinson, C. E.	1854	About 3 months, vaccinated by Dr. Hill, Mayor of Lincoln.	"	"	Obstinate skin disease followed the operation. He was an invalid for nearly 20 years, and then had small-pox. Fish-like scales would rub off the body.
236	Wilkinson, J. A.	March 1868	4 months	"	"	The vesicles did not rise, but spots, pimples, boils, abscesses, and general corruption followed the operation, until death mercifully ended his sufferings five months after vaccination.
237	Wells, F.	"	3 months	"	"	After vaccination the child's body broke out all over sores. It was ill for nine or ten months.
238	Wilkinson, A.	About October 1865	"	"	"Never a spot before"	Sores broke out on the child's head, especially behind the ears. Some came out on his body. One was on the face when he died, at the age of 2 years and 10 months.
239	Waterfield, A. J.	August 1875	About 3 months	"	Quite well	The vaccinated arm became swollen, sores forming in the armpit. The child was very weak for three years, and is not yet quite well.
240	Wilson, L.	"	In infancy	"	"	Sores appeared on the vaccinated arm, and afterwards broke out on the neck.
241	Wright, N.	October 1880	3 months	"	"	The child had a very bad ulcerated arm after the operation, and was ill for several months. Nervous debility followed.
242	Weston, M. A.	About November 1880	About 2 months	"	Well before	Scabs broke out all over the head, neck, and shoulders. The child was a great sufferer. Its hands had to be tied for three months.
243	Wragg, S.	About October 1874	3 months	"	Good health	Inflammation spread from the arm to the head and the face. The child was never well again. She became blind, and lost her reason. She used to lie in the cradle grinding her teeth, swaying to and fro, and making unintelligible noises.
						Remarks.
						The doctor said it died of "bronchitis and whooping cough."
						Parents healthy.
						The medical certificate stated, as the cause of death, "Diffused erysipelas after vaccination."
						Parents healthy. They had one child which died from cholera. The rest are healthy.
						Born November 1887. The father says that the child was inoculated with syphilis. The parents are very healthy, each being now 72 years of age.
						Parents and the other children healthy.
						The doctor gave the cause of death as "Bronchitis."
						Parents healthy.
						Parents healthy, and the other children healthy.
						The father is dead. The mother and the other children are healthy.
						Parents healthy.
						Parents healthy. There is no trace of insanity in either of their families. Two other children of the same parents, which were previously healthy, died after vaccination, one 10 months old, and the other at two years of age.



App. No. 3.

*(Papers handed in by Mr. John Thomas Biggs.)*

TABLE 5.

TABLE\* showing, for the Borough of Leicester for each of the years 1838-89, the Small-pox Death-rate per 1,000,000 living.

Year.	Deaths.	Year.	Deaths.	Year.	Deaths.
1838	230	1858	804	1878	9
1839	1,024	1859	45	1879	0
1840	1,121	1860	30	1880	0
1841	607	1861	15	1881	16
1842	0	1862	0	1882	40
1843	0	1863	68	1883	23
1844	167	1864	1,370	1884	0
1845	2,994	1865	127	1885	0
1846	215	1866	37	1886	0
1847	18	1867	24	1887	0
1848	537	1868	12	1888	0
1849	1,124	1869	0	1889	0
1850	84	1870	0		
1851	33	1871	125		
1852	846	1872	3,523		
1853	177	1873	20		
1854	0	1874	0		
1855	0	1875	9		
1856	16	1876	0		
1857	261	1877	54		

\* See Diagram B.—J. T. B.

TABLE 6.

TABLE\* showing, for the Borough of Leicester for each of the years 1849-89, the number of Registered Vaccinations to each 5,000 Births.†

Year.	Vaccina- tions.	Year.	Vaccina- tions.	Year.	Vaccina- tions.
1838	Not known.	1858	4,497	1878	3,528
1839		1859	2,873	1879	3,349
1840		1860	3,444	1880	2,969
1841		1861	3,172	1881	3,626
1842		1862	2,547	1882	3,198
1843	Official records incomplete.	1863‡	2,734 (7,020)	1883	2,029
1844		1864	3,075	1884	1,817
1845		1865	1,834	1885	1,967
1846		1866	2,405	1886	1,158
1847		1867	2,158	1887	502
1848	3,710	1868	4,709	1888	326
1849		1869	4,734	1889	179
1850		1870	4,084		
1851		1871	4,056		
1852		1872	5,353		
1853	4,036	1873	4,151		
1854	4,630	1874	4,303		
1855	3,843	1875	4,130		
1856	3,686	1876	3,583		
1857	3,851	1877	3,843		

\* See Diagram B.

† For the actual number of annual vaccinations see Table 51.

‡ In 1863-64 there were 4,320 vaccinations performed by the Medical Officers to the Guardians, at the public expense, in addition to the registered vaccinations given on my annual tables. These 4,320 vaccinations were almost wholly those of children omitted in previous years. Based on an annual birth-rate of 5,000 this makes an addition of 7,020 to the number given above for the years 1863-64. (See also my note to Table 51.)—J. T. B.

TABLE 7.

TABLE\* showing, for the Borough of Leicester for each of the years 1849-89, the number of Registered Vaccinations per 100,000 of the Population.†

Year.	Vaccina- tions.	Year.	Vaccina- tions.	Year.	Vaccina- tions.
1838	Not known.	1858	3,073	1878	2,934
1839		1859	2,170	1879	2,674
1840		1860	2,621	1880	2,395
1841		1861	2,350	1881	2,768
1842		1862	1,955	1882	2,454
1843	Official records incomplete.	1863‡	2,187 ‡(5,789)	1883	1,508
1844		1864	2,529	1884	1,322
1845		1865	1,514	1885	1,345
1846		1866	2,018	1886	797
1847		1867	1,837	1887	325
1848	2,736	1868	3,886	1888	210
1849		1869	3,952	1889	114
1850		1870	3,351		
1851		1871	3,359		
1852		1872	4,545		
1853	2,964	1873	3,655		
1854	3,613	1874	3,651		
1855	2,824	1875	3,330		
1856	2,749	1876	3,118		
1857	2,888	1877	3,251		

\* See Diagram B.

† For the actual number of annual vaccinations see Table 51.

‡ The "extra vaccinations" for 1863-64 (see Table 6) calculated on the basis of 100,000 population.—J. T. B.

TABLE 8.

TABLE\* showing, for the Borough of Leicester for the highest years of Epidemics during a period of 52 years (1838-89), (1), the Small-pox death-rate per 1,000,000 living; (2), the average annual Registered Vaccinations to every 5,000 Births; and (3), the accumulated Vaccinations per 100,000 living for the five years ending with, and including, each Epidemic year.†

Years.	Small-pox death-rate per 1,000,000.	Average annual Vaccinations to 5,000 Births for five years ending with and including each year named in Column 1.	Accumulated Vaccinations, per 100,000 population, for five years ending with and including each year named in Column 1.
1840	1,121	Not known.	Not known.
1845	2,994	{ Returns incomplete.	Returns incomplete.
1849	1,124	3,710 (1 year)	2,742 (1 year.)
1852	846	3,139 (4 years)	9,424 (4 years.)
1858	804	4,091	14,779
1864	1,370	4,398	16,647
1872	3,523	4,587	18,047
1877	54	4,002	16,219
1882	40	3,334	12,582
1884 to 1889	{ None for 6 years.	{ 2,728 826	{ 9,847 2,587

\* See Diagram C.

† For the actual number of annual vaccinations see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



This diagram shows the total number of births, deaths, and zymotic deaths, for each year from 1833 to 1863, inclusive, also the registered public, and private vaccinations of each year's births, as far back as obtainable from official sources. The table appended supplies the figures illustrated by the diagram, and contains in addition the marriages and corrected populations for each year.

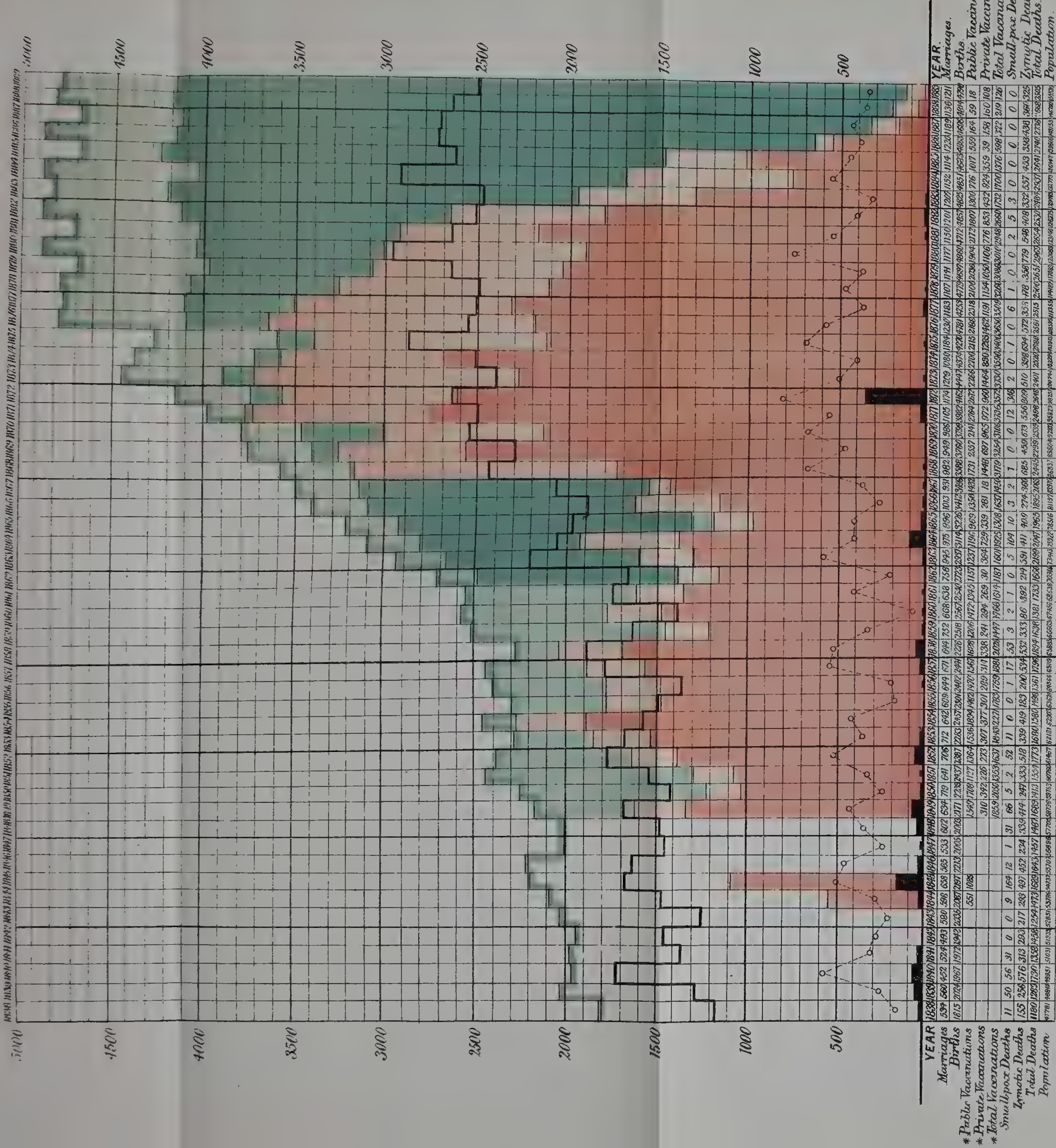
The blue from the base line of the diagram to the upper edge shows the number of births; the light shade (from the year 1838) indicating the proportion of children who died before the notice of the Vaccination Officer were served upon the parents.

The red measured from the base line shows the number of vaccinee; the light shade indicating the approximate proportion of operations performed by private practitioners.

The upper dark curve (—), measured from the base line, shows the total deaths from all causes.

The lower dotted curve (---), measured from the base line, shows the deaths from the seven principal Zymotic Diseases, namely, Small-pox, Measles, Scarlat Fever, Diphtheria, Whooping Cough, Fever, Typhus, Typhoid, and Simple Continued, and Diarrhea.

The black shows the total Small-pox deaths.



(In 1863-64 there were 3928 extra vaccinations, performed at the public expense, which are not shown on this diagram.)

\*NOTE.—The vaccination figures in the above table were supplied to me by Mr. L. P. Chamberlain, the Clerk to the Vaccination Authority at Leicester. Owing to the criticisms passed upon his figures, I have myself examined the official records and have again taken out the figures, which I give below. As my figures show a more accurate distribution for the various years than those supplied by Mr. Chamberlain, I have used them in preference to his in this Diagram A only, where they are shown by the part coloured red. But in all my other tables and diagrams I have used the figures given in Table 51 (page 455) which are the actual primary vaccinations, irrespective of age, performed in each year. I found the extra vaccinations for 1865-64 were 4320. See footnote to Table 51, J.T.B.

YEAR	Public Vaccinations	Private Vaccinations	Total Vaccinations
1833	1833	1833	1833
1834	1834	1834	1834
1835	1835	1835	1835
1836	1836	1836	1836
1837	1837	1837	1837
1838	1838	1838	1838
1839	1839	1839	1839
1840	1840	1840	1840
1841	1841	1841	1841
1842	1842	1842	1842
1843	1843	1843	1843
1844	1844	1844	1844
1845	1845	1845	1845
1846	1846	1846	1846
1847	1847	1847	1847
1848	1848	1848	1848
1849	1849	1849	1849
1850	1850	1850	1850
1851	1851	1851	1851
1852	1852	1852	1852
1853	1853	1853	1853
1854	1854	1854	1854
1855	1855	1855	1855
1856	1856	1856	1856
1857	1857	1857	1857
1858	1858	1858	1858
1859	1859	1859	1859
1860	1860	1860	1860
1861	1861	1861	1861
1862	1862	1862	1862
1863	1863	1863	1863
1864	1864	1864	1864
1865	1865	1865	1865
1866	1866	1866	1866
1867	1867	1867	1867
1868	1868	1868	1868
1869	1869	1869	1869
1870	1870	1870	1870
1871	1871	1871	1871
1872	1872	1872	1872
1873	1873	1873	1873
1874	1874	1874	1874
1875	1875	1875	1875
1876	1876	1876	1876
1877	1877	1877	1877
1878	1878	1878	1878
1879	1879	1879	1879
1880	1880	1880	1880
1881	1881	1881	1881
1882	1882	1882	1882
1883	1883	1883	1883
1884	1884	1884	1884
1885	1885	1885	1885
1886	1886	1886	1886
1887	1887	1887	1887
1888	1888	1888	1888
1889	1889	1889	1889
1890	1890	1890	1890
1891	1891	1891	1891
1892	1892	1892	1892
1893	1893	1893	1893
1894	1894	1894	1894
1895	1895	1895	1895
1896	1896	1896	1896
1897	1897	1897	1897
1898	1898	1898	1898
1899	1899	1899	1899
1900	1900	1900	1900







(Papers handed in by Mr. John Thomas Biggs.)

DIAGRAM B, illustrating Tables 5, 6, and 7.

This diagram shows (1) An enormous rise in Small-pox mortality after a quarter of a century of continuous vaccination up to 1872, which period ends with five years' penal enforcement of vaccination, and the highest Small-pox epidemic known in Leicester for more than fifty years ;

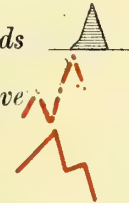
(2) From 1872 a rapid decline in vaccination is observable, and is coincident with our lowest known rate of Small-pox mortality, and with the introduction of the Leicester treatment of this disease ;

(3) With the abandonment of vaccination and the perfecting of the "Leicester Method" of Sanitation, Isolation, Quarantine, Disinfection, &c., during the last six years Small-pox mortality becomes extinct.

Black Pyramids

Red dotted curve

Red curve



Annual deaths from Small-pox per million of population.

Annual registered vaccinations to 5,000 births.

Annual registered vaccinations per 100,000 population.

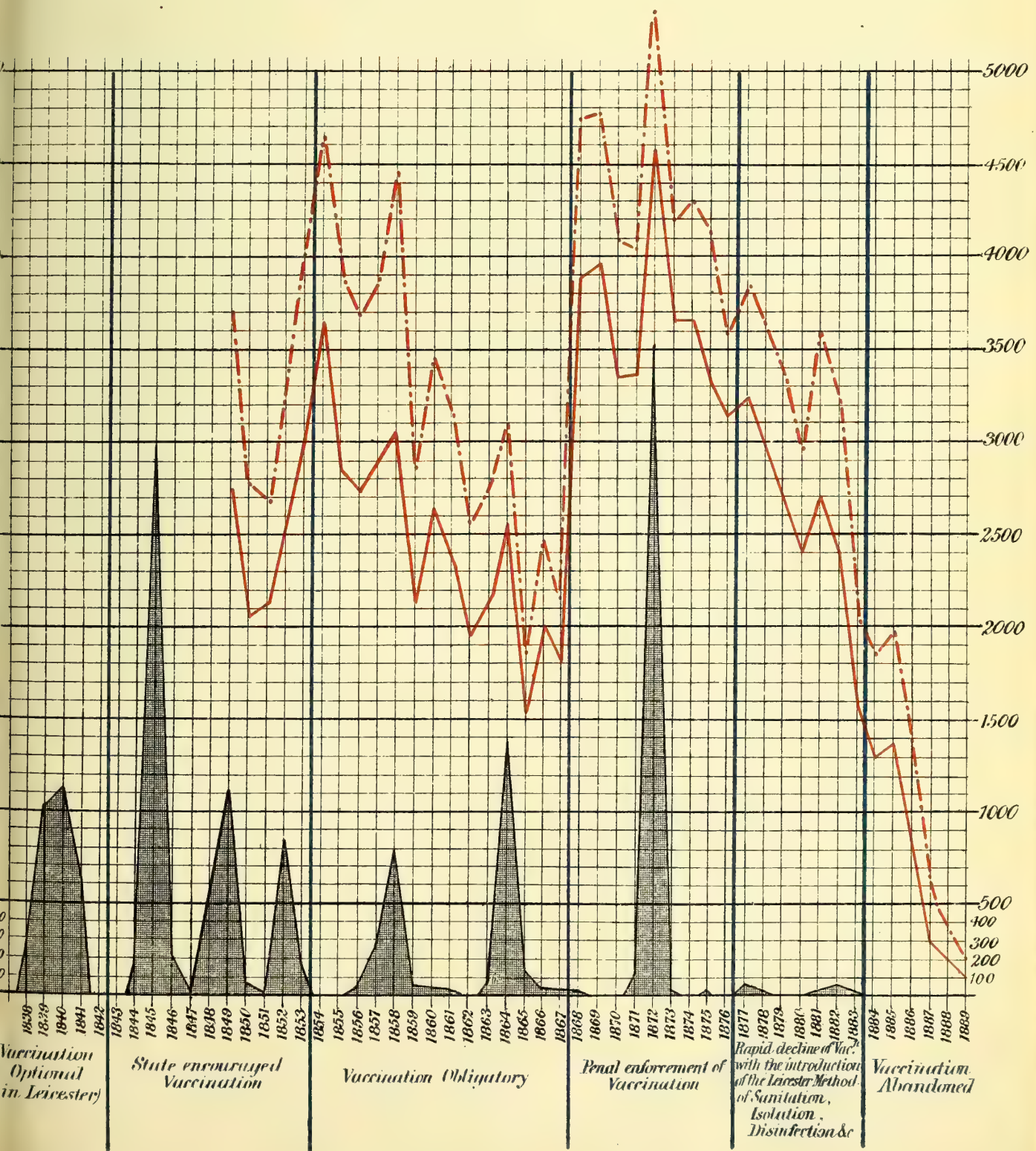









DIAGRAM C, illustrating Table 8.


Diagram shows (1) Highest epidemic years of Small-pox mortality (per million living) in each of seven successive epidemics from 1838 to 1872, ending with the most fatal epidemic year (1872), after a quarter of a century of continuous vaccination;

(2) Two invasions of Small-pox subsequent to 1872, when vaccination was falling into discredit, both of which invasions were speedily stamped out by the "Leicester Method" of treatment;

(3) Vaccination being practically abandoned, and the "Leicester Method" of Sanitation, Isolation, Quarantine, Disinfection, &c., being meanwhile perfected, Small-pox mortality entirely disappears after 1883, notwithstanding a considerable number of importations of the disease into the town, mostly from well vaccinated districts.

Black columns 

Small-pox per million of population.

Blue curve 

Average annual registered vaccinations to 5,000 births, for 5 years ending with and including each year shown on diagram.

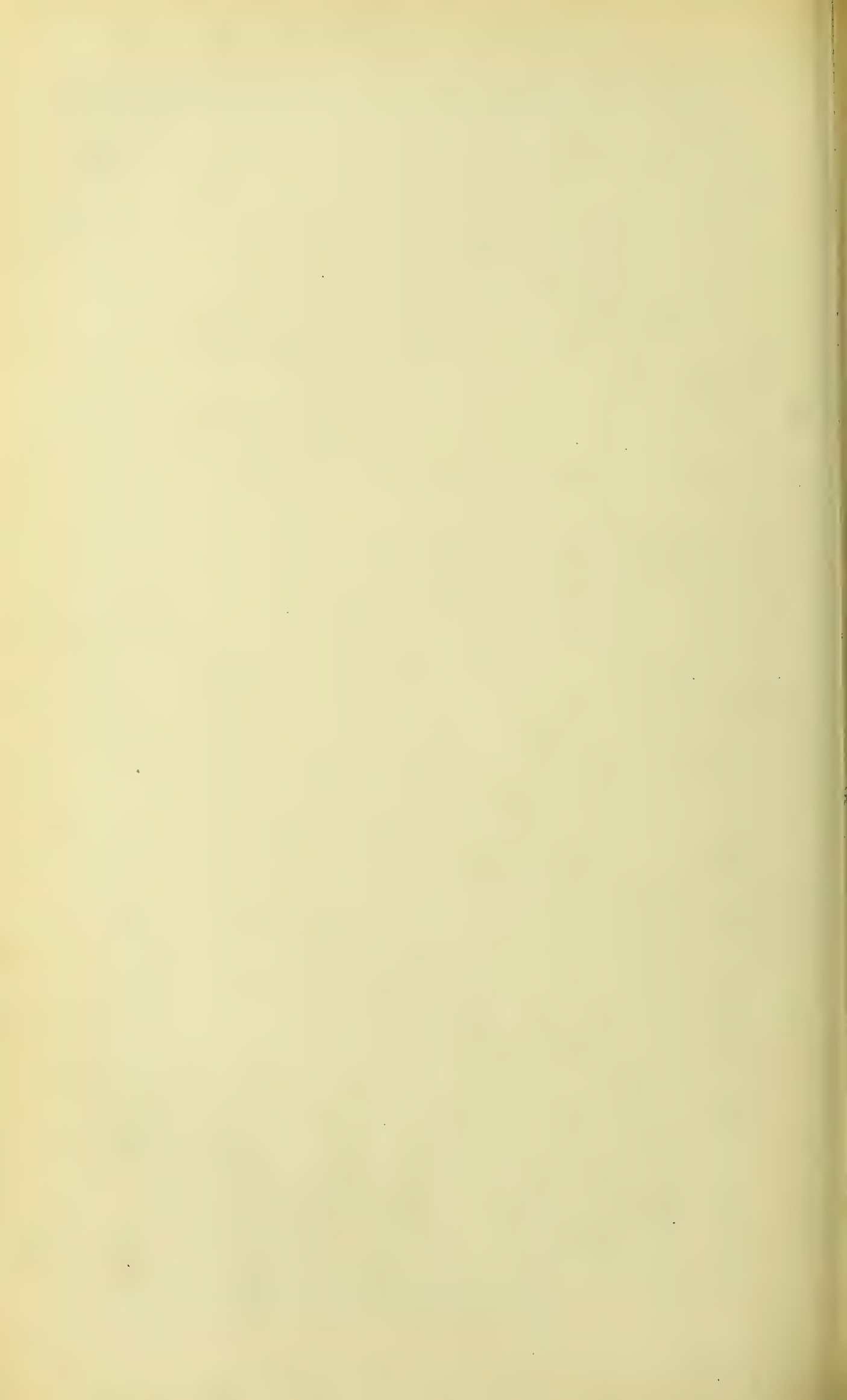
Red curve 

Accumulated registered vaccinations for 5 years (as above) per 100,000 population. (Twenty-five per cent. only is shown so as to bring the curve within the compass of the diagram.)

(The space between solid and dotted curves shows the addition for private vaccinations, 1849-62.)













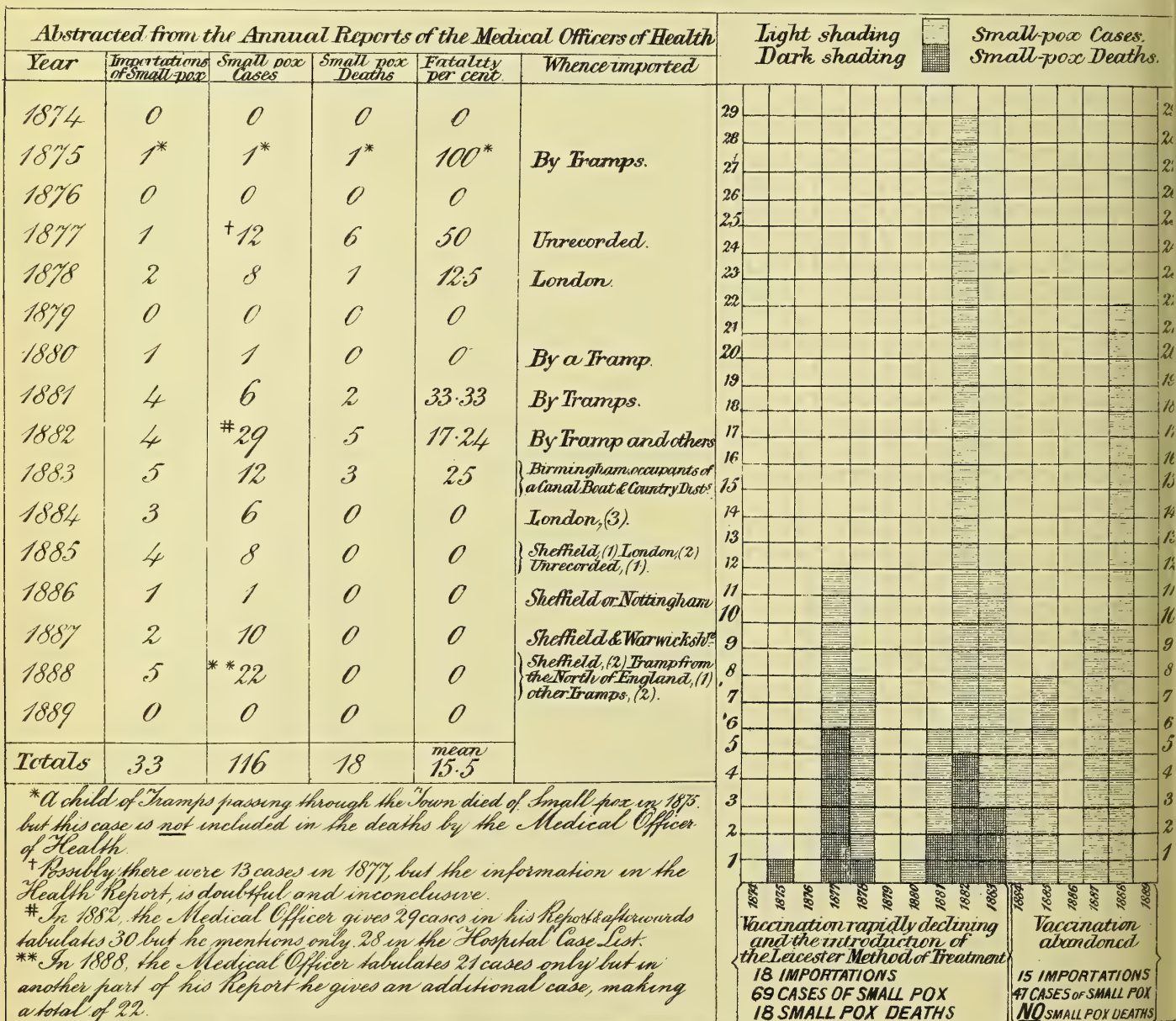
(Papers handed in by Mr. John Thomas Biggs.)

## DIAGRAM D.

This diagram shows (1) The total number of Small-pox cases which have occurred (or come to the knowledge of the Medical Officers of Health), in and near Leicester, since the subsidence of the great epidemic of 1871-73. Most of these cases were due to importations from efficiently vaccinated towns and districts.

(2) Of the total number of 116 cases, sixty-nine occurred during the years 1877-83. Out of these 69 cases eighteen deaths resulted, giving a fatality of 26.1 per cent. Of the 47 cases which occurred during 1884-89 no deaths resulted, thus giving a mean fatality of 15.5 for the whole 116 cases.

From 1874 to 1889 inclusive, during a period of 16 years, no fewer than 33 importations and a large number of successive outbreaks of Small-pox were successfully stamped out, and the town saved from the further spread of the disease, with its possible ravages, by the "Leicester Method" of treatment, without recourse to vaccination. ☞



☞ The only Vaccinations or Re-vaccinations of Quarantined persons recorded in the Annual Reports of the Medical Officers of Health are two in 1886, and six in 1888. Some are referred to in 1887, but exact information prior to 1886 is not obtainable owing to no Register having been kept at the Fever Hospital. The total number of persons placed in Quarantine 1885-1888 was 65: namely 10 in 1885, 2 in 1886, 14 in 1887 and 39 in 1888, since which date no Small-pox cases have either occurred or been imported into the Town.











DIAGRAM F. illustrating Table 12.

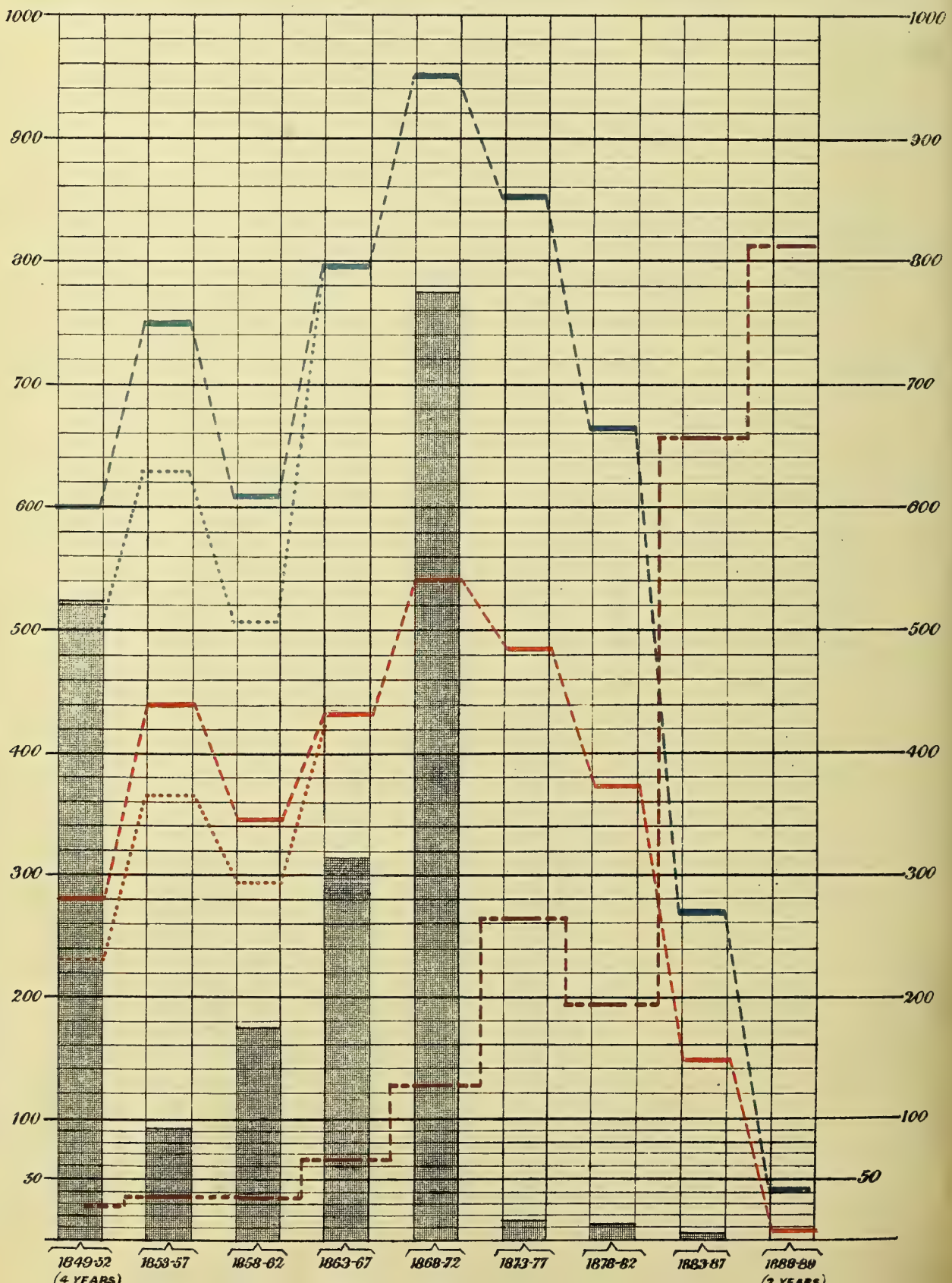
This diagram shows, (1) The average annual Small-pox death-rate per million population in successive quinquennia since the earliest year of obtainable official vaccinations (1849);

(2) After more than 20 years of continuous vaccination a great increase of Small-pox mortality, which culminates in the unprecedented fatality of 1868-72, when vaccination reached its highest point;

(3) Subsequent to 1872 a rapid decline in vaccination until it was practically abandoned, and an equally marked increase in Sanitation, &c., when Small-pox mortality also rapidly declines and becomes extinct.

Black columns  Small-pox deaths per million.  
Blue curve  Average annual registered vaccinations per 25,000 population.  
Red curve  Accumulated vaccinations per 100,000 population for 5 years ending with the last year of each period. (Three per cent. only shown to suit the compass of the diagram.)  
Brown curve  Average Annual number of sanitary orders to abate nuisances (10 per cent. only shown on diagram.)

(The space between solid and dotted curves shows the addition for private vaccinations, 1849-1862.)





(Papers handed in by Mr. John Thomas Biggs.)

App. No.

TABLE 9.

TABLE showing, for the Borough of Leicester for the years 1886, 1887 and 1888, the Number of Persons vaccinated or re-vaccinated after voluntarily entering the Quarantine Wards at the Fever Hospital after possible exposure to Small-pox infection.

Year.	No. of persons in Quarantine	No. of persons vaccinated after entering Quarantine.	No. of persons re-vaccinated after entering Quarantine.	The vaccinal condition of those (43) persons not submitting to the operation whilst in Quarantine.	
				Vaccinated.	Un-vaccinated.
1886 -	2	0	2	0	0
1887 -	14	4	1	9*	0
1888 -	39	2	3	30†	4
Totals -	55	6	6	39	4

\* Two of these were vaccinated only two days before entering the quarantine wards.

† One of these was vaccinated only one day before.—J. T. B.

TABLE 10.

TABLE\* showing, for the Borough of Leicester for each of the years 1874-89, the Number of Persons who voluntarily entered the Quarantine Wards at the Fever Hospital after possible exposure to Small-pox Infection, with the estimated Cost of such Cases; also the Number of Small-pox Cases for each of the same years.

Year.	Small-pox cases.	No. of persons in Quarantine.	Cost per person for 14 days Quarantine.	Total Cost.
			£ s. d.	£ s. d.
1874 -	0	0	—	—
1875 -	0	0	—	—
1876 -	0	0	—	—
1877 -	12	22	2 11 1	56 3 10
1878 -	8	21	2 11 1	53 12 9
1879 -	0	0	—	—
1880 -	1	0	—	—
1881 -	6	3	2 11 1	7 13 3
1882 -	29	33*	2 11 1	84 5 9
1883 -	12	26*	2 11 1	66 8 2
1884 -	6	13*	2 11 1	33 4 1
1885 -	8	10	0 19 0	9 10 0
1886 -	1	2	1 3 0	2 6 0
1887 -	10	14	2 4 8	31 5 4
1888 -	21	39	3 3 0	122 17 0
1889 -	0	0	—	—
Totals -	114	183	—	467 6 2

\* This table has, for the most part, been compiled from the reports of the Medical Officer of Health, but the figures marked with an asterisk (\*) have been obtained principally from information supplied by the chief Sanitary Inspector, no exact records having been kept of quarantined persons until 1886. For each of the four years 1885-88 the Medical Officer of Health has published the weekly cost of each hospital patient, including quarantined persons. (See Health Reports for those years.) He thus takes the maintenance of a person in quarantine to be equivalent to the cost of an ordinary patient. On this basis of calculation the average cost of the 65 persons quarantined during 1885-88 was a fraction under 2l. 11s. 1d. for each person for the usual quarantine period of 14 days. This rate has, therefore, been taken in the above table as a fair average for the years 1877, 1878, and 1881-84, for which years there is no exact official information.—J. T. B.

TABLE 11.

TABLE\* showing, for the Borough of Leicester during the years 1838-89, in quinquennial periods, (1) the average annual Small-pox death-rate per 1,000,000 living; (2) the average annual Registered Vaccinations to every 1,000 Births; and (3) the accumulated Vaccinations per 100,000 living at the close of each period.†

Periods.	Average annual Small-pox deaths per 1,000,000.	Accumulated Vaccinations per 100,000 population for five years ending with last year of each period.	Average annual Registered Vaccinations to 1,000 Births.
1838-42	592	Not known.	Not known.
1843-47	679	Not known.	Not known.
		Returns incomplete.	Returns incomplete.
1848-52	522	9,424 (4 years)	628 (4 years.)
1853-57	91	14,653	802
1858-62	175	11,603	659
1863-67	316	14,544	769
1868-72	773	18,047	917
1873-77	17	16,219	800
1878-82	13	12,582	667
1883-87	4	4,995	299
1888-89	0	323	51
(2 years)		(2 years only.)	(2 years.)

\* See Diagram E.

† For the actual number of annual vaccinations see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.

TABLE 12.

TABLE\* showing, for the Borough of Leicester during the years 1849-89, in quinquennial periods, (1) the total number of Small-pox deaths; (2) the average annual Small-pox death-rate per 1,000,000 living; (3) the accumulated Vaccinations per 100,000 living at the close of each period, (4) the average annual number of Registered Vaccinations per 25,000 living; and, (5) the average annual number of Sanitary Orders to abate nuisances.†

Period.	Number of Small-pox deaths.	Average annual Small-pox death-rate per 1,000,000.	Accumulated Vaccinations per 100,000 population for five years ending with the last year of each period.	Average annual Vaccinations per 25,000 population.	Average annual number of Sanitary Orders.
1849-52 (4 years)	125	522	9,424 (2 years)	599	Not known.
1853-57	29	91	14,653	752	Returns incomplete.
1858-62	59	175	11,603	609	397
1863-67	124	316	14,544	794	351
1868-72	359	773	18,047	955	501
1873-77	9	17	16,219	850	1,133
1878-82	8	13	12,582	661	2,619
1883-87	3	4	4,995	265	1,882
1888-89	0	0	323	41	6,529
(2 years)			(2 years only)		8,137

\* See Diagram F.

† For the actual number of annual vaccinations see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 13.

TABLE showing, for the Borough of Leicester, (1) for each of the years 1838-89 the Small-pox death-rate per 1,000,000 living; for each of the years 1849-89 the per-centage of Registered Vaccinations to total Births; (3) for each of the years 1862-89 the per-centage of Registered Vaccinations to Births after deducting the dead unvaccinated; and (4) for each of the years 1853-89 the accumulated Vaccinations registered for the five years ending with the enumerated year.\*

Year.	Small-pox death-rate per million.	Per-centage of Registered Vaccinations to Total Births.	Per-centage of Registered Vaccinations to Births living.	Accumulated Vaccinations for Five Years.	Year.	Small-pox death-rate per million.	Per-centage of Registered Vaccinations to Total Births.	Per-centage of Registered Vaccinations to Births living.	Accumulated Vaccinations for Five Years.
1838 - - -	230	Official Records incomplete.	Official Records incomplete.	Official Records incomplete.	1863 - - -	68	54·7 (140·4)†	60·5 (158·1)†	8,903†
1839 - - -	1,024				1864 - - -	1370	61·5	68·2	12,612†
1840 - - -	1,121				1865 - - -	127	36·7	40·3	12,029†
1841 - - -	607				1866 - - -	37	48·1	52·8	12,056†
1842 - - -	0				1867 - - -	24	43·2	49·1	12,212†
1843 - - -	0				1868 - - -	12	94·2	105·4	12,903†
1844 - - -	167				1869 - - -	0	94·7	104·3	11,307
1845 - - -	2,994				1870 - - -	0	81·7	90·3	13,227
1846 - - -	215				1871 - - -	125	81·8	85·3	14,816
1847 - - -	18				1872 - - -	3,523	107·1	119·0	17,728
1848 - - -	537	Official Records incomplete.	Official Records incomplete.	Official Records incomplete.	1873 - - -	20	83·0	94·9	18,041
1849 - - -	1,124				1874 - - -	0	86·1	101·3	18,245
1850 - - -	84				1875 - - -	9	82·6	97·7	18,669
1851 - - -	33				1876 - - -	0	71·7	84·6	18,865
1852 - - -	846				1877 - - -	54	76·9	88·8	18,062
1853 - - -	177				1878 - - -	9	70·6	82·6	17,742
1854 - - -	0				1879 - - -	0	67·0	79·3	17,124
1855 - - -	0				1880 - - -	0	59·4	71·3	16,483
1856 - - -	16				1881 - - -	16	72·5	84·7	16,474
1857 - - -	261				1882 - - -	40	64·0	75·2	15,927
1858 - - -	804				1883 - - -	23	40·6	46·6	14,513
1859 - - -	45				1884 - - -	0	36·3	43·7	13,130
1860 - - -	30				1885 - - -	0	39·3	43·1	12,086
1861 - - -	15				1886 - - -	0	23·1	26·9	9,791
1862 - - -	0				1887 - - -	0	10·0	11·4	7,156
					1888 - - -	0	6·5	7·7	5,512
					1889 - - -	0	3·6	4·2	3,921

\* These accumulated vaccinations for the years 1853-89 may be taken as equivalent to the number of the population "protected" by vaccination, assuming the "protection" lasts for five years. For the actual number of annual vaccinations see Table 51.  
† These figures show the increase due to the extra vaccinations in 1863-64.—J. T. B.

TABLE 14.

TABLE\* showing, for the Borough of Leicester during the years 1838-89, in quinquennial periods, (1) the average annual Small-pox death-rate per 1,000,000 living; (2) the average annual per-centage of Registered Vaccinations to total Births; and (3) to Births after deducting the dead unvaccinated; and, (4) the accumulated Vaccinations registered for the whole of each period.†

	Periods.	Small-pox Death-rate per million Population.	Average annual Per-centage of Registered Vaccinations to total Births.	Average annual Per-centage of Registered Vaccinations to Births living; omitting the Dead unvaccinated.	Accumulated Vaccinations for Five Years ending with the last year of each period.
I.	1838-42 - - -	592	62·8 (4 years)	Not known. Returns incomplete.	5,782 (4 years).
II.	1843-47 - - -	679		{ Not known. }	
III.	1848-52 - - -	522		{ No Records. }	
IV.	1853-57 - - -	91		56·9 (1 year)	
V.	1858-62 - - -	175		†85·8	
VI.	1863-67 - - -	316		100·8	
VII.	1868-72 - - -	773		93·4	
VIII.	1873-77 - - -	17		78·6	
IX.	1878-82 - - -	13		34·3	
X.	1883-87 - - -	4		6·0	
XI.	1888, 1889 - - -	0	5·1		486 (2 years only).

\* The figures in this table are those given in Table 13, grouped in quinquennial periods.  
These accumulated vaccinations for the periods between the years 1853 and 1887 may be taken as equivalent to the number of the population "protected" by vaccination, assuming the "protection" lasts for five years. For the actual number of annual vaccinations see Table 51.  
† With the "extra vaccinations for 1863-64." (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

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TABLE 15.

TABLE showing, for the Borough of Leicester during the years 1849-89, in quinquennial periods, the number of persons registered as Vaccinated with the balance of the Population.\*

1.	2.	3.		4.		5.		6.
—	Period.	Number and relative percentage of the population "protected" and "unprotected" assuming the protection lasts 5 Years.		Number and relative percentage of the population "protected" and "unprotected" assuming the protection lasts 10 Years.		Number and relative percentage of the population "protected" and "unprotected" assuming the protection lasts 15 Years.		Population for the last Year of each Period.
		"Protected."	"Unprotected."	"Protected."	"Unprotected."	"Protected."	"Unprotected."	
I.	1849-52 - (4 years ending with 1852.)	5,782 9.4	55,685 90.6					} 61,467
II.	1853-57 -	9,540 14.7	55,579 85.3	15,322 23.5 (9 years.)	49,797 77.5 (9 years.)			} 65,119
III.	1858-62 -	8,241 11.6	62,745 88.4	17,781 25.1	53,205 74.9	23,563 33.3 (14 years.)	47,423 67.0 (14 years.)	} 70,986
IV.	1863-67 -	12,212 14.6	71,758 85.4	20,453 24.4	63,517 75.6	29,993 35.7	53,977 64.3	} 83,970
V.	1868-72 -	17,728 18.0	80,523 82.0	29,940 30.5	68,311 62.5	38,181 38.9	60,070 61.1	} 98,251
VI.	1873-77 -	18,062 16.2	93,293 83.8	35,790 32.1	75,565 67.9	48,002 43.1	63,353 56.9	} 111,355
VII.	1878-82 -	15,927 12.6	110,348 87.4	33,989 26.9	92,286 73.1	51,717 41.0	74,558 59.0	} 126,275
VIII.	1883-87 -	7,156 5.0	135,997 95.0	23,083 16.1	120,070 83.9	41,145 28.7	102,008 71.3	} 143,153
IX.	1888, 89 - (The last 5 years end with 1889.)	3,921 2.6	146,599 97.4	17,051 11.3	133,469 88.7	34,175 22.7	116,345 77.3	} 150,520

\* In this table the numbers of persons registered as vaccinated are entered in the columns headed "protected" and the balance of the population in those headed "unprotected." The whole of the population is accounted for at the end of each period, no deduction having been made for deaths of vaccinated or unvaccinated, their respective numbers being made up by the growth of population. On the assumption that vaccination "protects" for five years only, column 3 gives the number alleged to be "protected" at the close of each five year period, with the balance of population left "unprotected." Column 4 gives the same for 10 years, and column 5 for 15 years. No re-vaccinations are included in the table, as it is impossible to obtain reliable and consecutive records of the few which occurred. For the actual number of annual vaccinations see Table 51.—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 16.  
TABLE showing, for the Borough of Leicester for each of the years 1838-89, the number of deaths from each of the seven principal Zymotic Diseases.

Diseases.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.
Small-pox -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Measles -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scarlet Fever -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diphtheria*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Whooping Cough -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fevers -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diarrhoea -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(Continued.)

Diseases.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
Small-pox -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Measles -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scarlet Fever -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diphtheria*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Whooping Cough -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fevers -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diarrhoea -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\* From 1838 to 1858 deaths registered from putrid and other sore throats have been tabulated as diphtheria. — J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

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TABLE 17.

TABLE\* showing, for the Borough of Leicester for the Years 1838-89, the Total Number of Deaths from each of the Seven principal Zymotic Diseases, with the Per-centage of the Deaths from each of those Diseases to the total Deaths from all of them.

Diseases.	Total Deaths for 52 Years.	Relative Per-centage of Deaths from each Disease to the Total Deaths from seven Zymotic Causes.
Small-pox - - - -	1,081	5.01
Measles - - - -	2,855	13.23
Scarlet Fever - - - -	2,987	13.84
Diphtheria - - - -	304	1.41
Whooping Cough - - - -	2,176	10.08
Fevers - - - -	2,858	13.24
Diarrhœa - - - -	9,319	43.19
Totals - - - -	21,580	100.00

\* This table is a summary of the figures given in Table 16.—J. T. B.

TABLE 18.

TABLE showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the Total and the average annual Number of Deaths from each of the Seven principal Zymotic Diseases, with the average annual Per-centage of registered Vaccinations to Births.\*

No.	Periods.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fevers.	Diarrhœa.	Totals.	Average annual Per-centage of registered Vaccinations to Total Births.
I.	1838-42 - {Deaths - - - 148 Average Annual - 29.6	328	189	20	130	382	396	1,593	318.6	} Not known.
		65.6	37.8	4	26	76.4	79.2			
II.	1843-47 - {Deaths - - - 186 Average Annual - 37.2	269	199	10	154	345	530	1,693	338.6	} Returns incomplete.
		53.8	39.8	2	30.8	69	106			
III.	1848-52 - {Deaths - - - 156 Average Annual - 31.2	215	239	10	169	404	658	1,851	370.2	} 62.8 (4 years).
		43	47.8	2	33.8	80.8	131.6			
IV.	1853-57 - {Deaths - - - 29 Average Annual - 5.8	219	169	18	113	403	724	1,675	335	} 80.2
		43.8	33.8	3.6	22.6	80.6	144.8			
V.	1858-62 - {Deaths - - - 59 Average Annual - 11.8	244	231	22	211	251	539	1,557	311.4	} 65.9
		48.8	46.2	4.4	42.2	50.2	107.8			
VI.	1863-67 - {Deaths - - - 124 Average Annual - 24.8	195	340	18	197	239	932	2,045	409	} 76.9†
		39	68	3.6	39.4	47.8	186.4			
VII.	1868-72 - {Deaths - - - 359 Average Annual - 71.8	403	397	39	224	292	1,468	3,182	636.4	} 91.7
		80.6	79.4	7.8	44.8	58.4	293.6			
VIII.	1873-77 - {Deaths - - - 9 Average Annual - 1.8	225	405	41	296	230	1,327	2,533	506.6	} 80.0
		45	81	8.2	59.2	46	265.4			
IX.	1878-82 - {Deaths - - - 8 Average Annual - 1.6	364	492	55	311	146	1,195	2,571	514.2	} 63.7
		72.8	98.4	11	62.2	29.2	239			
X.	1883-87 - {Deaths - - - 3 Average Annual - 0.6	254	316	48	259	112	1,181	2,173	434.6	} 29.0
		50.8	63.2	9.6	51.8	22.4	236.2			
XI.	1888-89 (2 years) {Deaths - - - 0 Average Annual - 0.0	139	10	23	112	54	369	707	353.5	} 5.
		69.5	5	11.5	56.0	27.0	184.5			

\* For the actual number of annual vaccinations, see Table 51.

† With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



*(Papers handed in by Mr. John Thomas Biggs.)*

TABLE 19.

TABLE showing, for the Borough of Leicester, for each of the Years 1838-89, the Death-rate from each of the Seven principal Zymotic Diseases per million living, with, for each of the Years 1849-89, the Per-centage of registered Vaccinations to Births.\*

Year.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fevers.	Diarrhoea.	Totals.	Per-centage of registered Vaccinations to Total Births.
1838	220	104	21	42	565	1,319	963	3,244	Returns incomplete.
1839	1,024	860	41	103	840	1,374	1,000	5,242	
1840	1,121	3,703	1,942	80	440	1,923	2,322	11,531	
1841	607	156	1,460	78	254	1,666	1,901	6,131	
1842	0	1,694	268	96	521	1,367	1,694	5,640	
1843	0	1,549	284	0	322	776	1,174	4,105	Not known.
1844	167	74	1,804	56	1,172	781	1,395	5,449	
1845	2,994	2,758	1,351	37	164	657	1,114	9,075	
1846	215	72	180	18	198	3,170	4,260	8,113	
1847	18	494	53	70	952	864	1,676	4,127	
1848	537	1,040	243	0	398	1,421	2,235	5,874	74·2
1849	1,124	1,157	85	34	1,022	1,516	2,112	7,050	
1850	84	803	184	50	167	1,355	1,489	4,132	
1851	33	594	806	0	214	1,168	2,666	5,481	
1852	846	49	2,603	81	1,025	1,317	2,506	8,427	
1853	177	128	659	32	563	1,672	2,220	5,451	80·7
1854	0	2,050	159	95	270	1,604	2,480	6,658	92·6
1855	0	16	78	47	110	850	1,776	2,877	76·9
1856	16	233	171	31	342	528	1,785	3,106	73·7
1857	261	1,013	1,566	76	491	1,688	3,102	8,197	77·0
1858	804	834	2,655	61	501	1,397	1,818	8,070	88·9
1859	45	795	585	150	1,290	570	1,560	4,995	57·5
1860	30	89	30	30	103	163	830	1,275	68·9
1861	15	1,806	15	58	597	888	2,332	5,711	63·4
1862	0	84	197	28	620	690	1,394	3,013	50·9
1863	68	1,227	3,182	93	418	688	2,292	7,968	54·7 (140·4)†
1864	1,370	39	619	26	500	487	2,371	5,412	61·5
1865	127	1,095	102	38	254	713	2,877	5,206	36·7
1866	37	160	111	37	566	653	1,811	3,375	48·1
1867	24	24	479	36	742	503	2,504	4,312	43·2
1868	12	2,843	103	115	69	725	4,017	7,884	94·2
1869	0	478	89	100	778	634	3,025	5,104	94·7
1870	0	452	2,833	118	700	560	2,585	7,248	81·7
1871	125	368	1,176	74	336	588	3,171	5,838	81·1
1872	3,523	366	51	20	519	651	3,105	8,235	107·1
1873	20	615	60	69	635	545	3,115	5,059	83·0
1874	0	232	174	77	416	464	2,489	3,852	86·1
1875	9	463	1,654	66	859	605	2,911	6,567	82·6
1876	0	461	1,593	92	304	396	2,422	5,268	71·7
1877	54	359	296	80	583	179	1,661	3,212	76·9
1878	9	394	105	44	718	271	2,646	4,187	70·6
1879	0	616	899	94	521	179	753	3,062	67·0
1880	0	1,383	991	192	224	383	3,316	6,489	59·4
1881	16	57	1,495	89	991	238	1,568	4,454	72·5
1882	40	586	571	40	150	150	1,695	3,231	64·0
1883	23	116	703	46	456	77	1,145	2,566	40·6
1884	0	430	475	83	497	121	2,594	4,200	36·3
1885	0	382	829	102	382	264	1,866	3,325	39·5
1886	0	308	315	29	193	136	1,832	2,813	23·1
1887	0	607	35	90	384	217	1,724	3,057	10·0
1888	0	524	27	89	585	218	1,008	2,451	6·5
1889	0	412	39	66	173	146	1,468	2,304	3·6

\* For the actual number of annual vaccinations, see Table 51.

† The "extra vaccinations," 1863-64. (See Table 6.)—J. T. B.







(Papers handed in by M<sup>r</sup>. John Thomas Biggs.)

DIAGRAM G, illustrating Table 20.

This diagram shows, (1) The Average annual death-rate per million population from the seven principal zymotic diseases, with the relative proportion of deaths from each disease, in quinquennial periods, 1838-89;

(2) An unprecedented increase of zymotic mortality coincident with the highest vaccination period, 1868-72; and

(3) A marked decline of zymotic mortality, also coincident with the decline and practical abandonment of vaccination subsequent to 1872.

Small-pox (lowest) ■ Measles ■ Scarlet Fever ■ Diphtheria ■  
 Whooping Cough ■ Fevers ■ Diarrhœa (highest). ■  
 Average annual registered vaccinations to 10,000 births.

(The space between solid and dotted curves shews the addition for private vaccinations, 1849-62.)

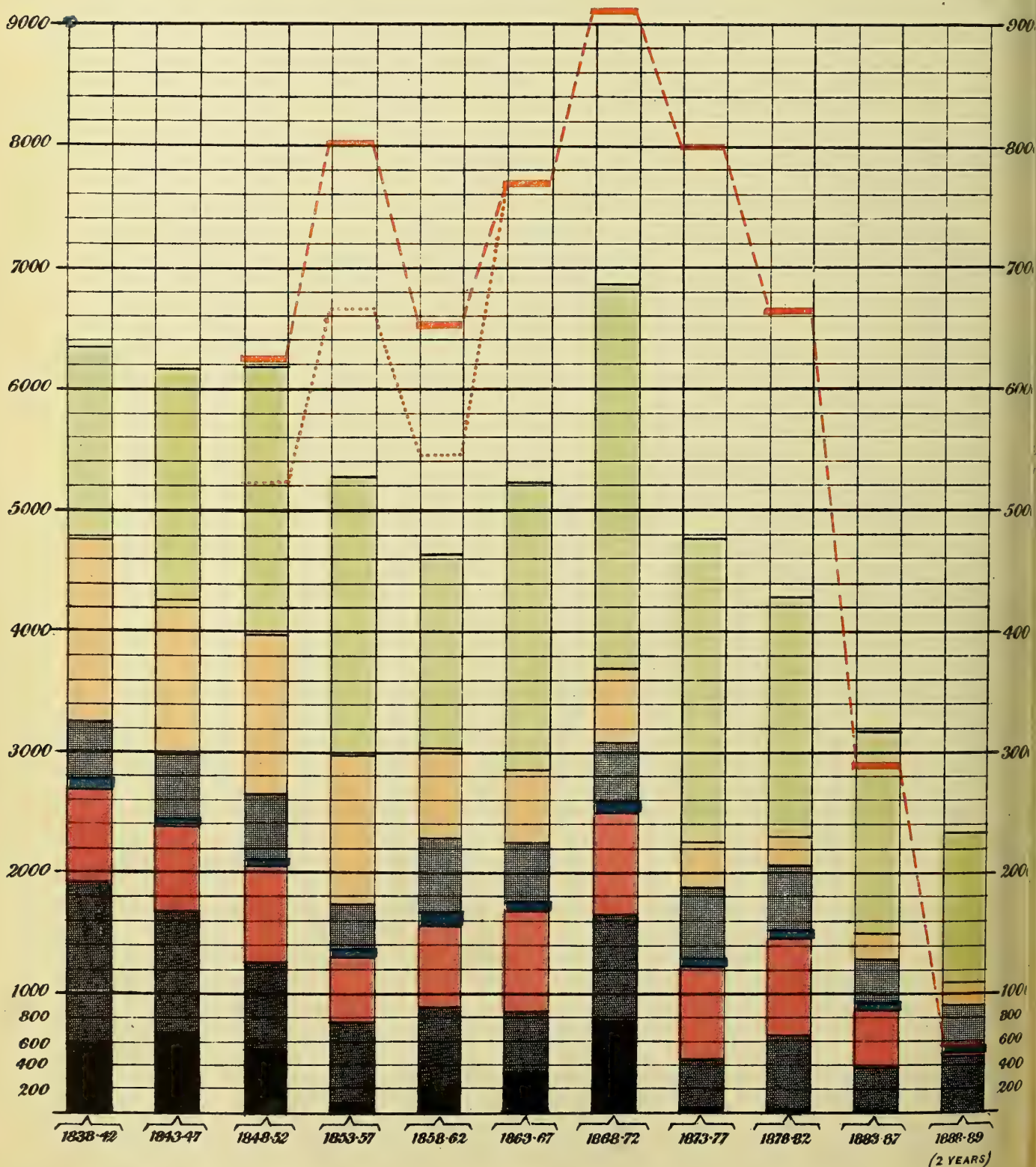










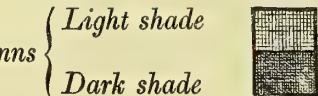


DIAGRAM H. illustrating Table 21.

This diagram shows, (1) The average annual death-rate per million living, from the seven principal zymotic diseases, in quinquennial periods, 1838-1889;

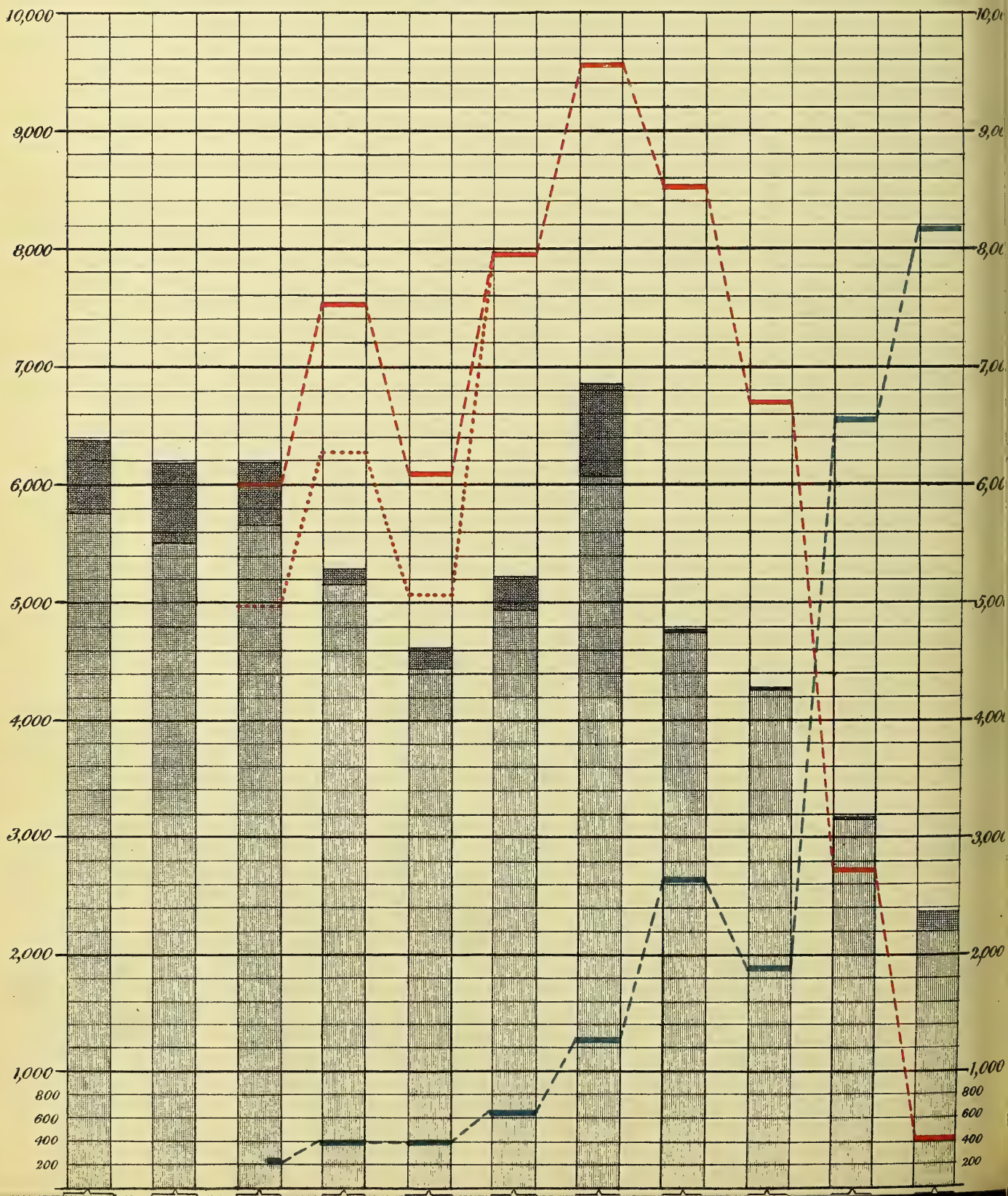
(2) A gradual decrease in zymotic mortality in the earlier periods (since 1848-52), as sanitary measures were introduced;

(3) Increased and unprecedented zymotic fatality coincident with the penal enforcement of vaccination (1868-72), its rapid decline with the falling off of vaccination (1873-82), and the very low rate of zymotic mortality coincident with the practical abandonment of vaccination (since 1882) and the further development of sanitation; and

(4) That the share borne by Small-pox of the death-rate from the seven zymotic causes alone, is comparatively insignificant.

- (a) Red curve  Average annual registered vaccinations per quarter million population.
- (b) Blue curve  Average annual number of sanitary orders to abate nuisances.
- (c) Black columns    
 { Light shade  Death-rate per million population from six principal zymotic diseases, excluding Small-pox.   
 { Dark shade  Small-pox death-rate making up the total mortality from the seven principal zymotic diseases.

(The space between the dotted and solid red curve shows the addition for private vaccinations, 1849-62.)





(Papers handed in by Mr. John Thomas Biggs.)

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TABLE 20.

TABLE\* showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average annual Death-rate from each of the Seven principal Zymotic Diseases per million living, and the Per-centage of the Deaths from each of those Diseases to the Deaths from all of them, with the average annual registered Vaccinations to 10,000 Births.†

No.	Periods.	—	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fevers.	Diarrhoea.	Totals.	Average annual registered Vaccinations to 10,000 Births.
I.	1838-42	Per million -	592	1,313	757	80	520	1,529	1,586	6,377	Not known.
		Per-centage -	9.3	20.6	11.9	1.2	8.1	24.0	24.9	100	
II.	1843-47	Per million -	679	983	727	36	563	1,260	1,938	6,186	Returns incomplete.
		Per-centage -	11	16	11.2	0.6	9.1	20.6	31.5	100	
III.	1848-52	Per million -	522	719	800	34	565	1,352	2,201	6,193	6,278 (4 years)
		Per-centage -	8.4	11.6	12.9	0.5	9.1	21.8	35.7	100	
IV.	1853-57	Per million -	91	688	531	57	355	1,267	2,276	5,265	8,018
		Per-centage -	1.7	13.1	10.1	1.1	6.7	24	43.3	100	
V.	1858-62	Per million -	175	723	685	65	626	744	1,598	4,616	6,594
		Per-centage -	3.8	15.7	14.9	1.4	13.5	16.2	34.5	100	
VI.	1863-67	Per million -	316	497	866	46	502	609	2,374	5,210	7,694‡
		Per-centage -	6.1	9.5	16.7	0.8	9.6	11.7	45.6	100	
VII.	1868-72	Per million -	773	868	855	84	482	629	3,161	6,852	9,174
		Per-centage -	11.3	12.7	12.5	1.2	7.0	9.2	46.1	100	
VIII.	1873-77	Per million -	17	425	765	78	557	484	2,507	4,783	8,004
		Per-centage -	0.4	8.9	16	1.6	11.6	9	52.5	100	
IX.	1878-82	Per million -	13	606	820	92	518	243	1,991	4,283	6,668
		Per-centage -	0.3	14.2	19.3	2.1	12	5.7	46.4	100	
X.	1883-87	Per million -	4	373	464	71	380	165	1,734	3,191	2,988
		Per-centage -	0.1	11.7	14.5	2.2	12	5.1	54.4	100	
XI.	1888-89 (2 years)	Per million -	0	468	34	78	379	182	1,238	2,379	506 (2 years)
		Per-centage -	0.0	19.7	1.4	3.3	16.0	7.6	52.0	100	
	Averages for the 11 periods	Per million -	289	696	664	66	491	764	2,055	5,030	
		Per-centage -	5.7	13.8	13.2	1.3	9.8	15.3	40.9	100	

\* See Diagram G.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.

TABLE 21.

TABLE\* showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average annual number of Deaths and the average annual Death-rate from the Seven principal Zymotic Diseases per million living, and from Six of those Diseases (excluding Small-pox), with the average annual registered Vaccinations per 250,000 living,† and the average annual number of Sanitary Orders to abate nuisances.

No.	Periods.	—	Seven Zymotics.	Six Zymotics, excluding Small-pox.	Average Annual registered Vaccinations per 250,000 population.	Average Annual Number of Sanitary Orders.
I.	1838-42	- {	Average annual deaths - 318.6 Death-rate per million - 6,377	289.0 5,786	No returns.	No returns.
II.	1843-47	- {	Average annual deaths - 338.6 Death-rate per million - 6,186	301.4 5,506		
III.	1848-52	- {	Average annual deaths - 370.2 Death-rate per million - 6,193	339.0 5,670	5,996	Returns incomplete.
IV.	1853-57	- {	Average annual deaths - 335.0 Death-rate per million - 5,265	329.2 5,174		
V.	1858-62	- {	Average annual deaths - 311.4 Death-rate per million - 4,616	299.6 4,441	6,084	397
VI.	1863-67	- {	Average annual deaths - 409.0 Death-rate per million - 5,210	384.2 4,893		
VII.	1868-72	- {	Average annual deaths - 636.4 Death-rate per million - 6,852	564.6 6,079	7,938‡	501
VIII.	1873-77	- {	Average annual deaths - 506.6 Death-rate per million - 4,783	504.8 4,766		
IX.	1878-82	- {	Average annual deaths - 514.2 Death-rate per million - 4,283	512.6 4,270	3,548	1,133
X.	1883-87	- {	Average annual deaths - 434.6 Death-rate per million - 3,191	434.0 3,187		
XI.	1888-89 (2 years)	{	Average annual deaths - 353.5 Death-rate per million - 2,379	353.5 2,379	2,648	6,529
					405	8,137 (2 years)

\* See Diagram H.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 22.

TABLE showing, for the Borough of Leicester for each of the Years 1838-89, the registered number of Persons Married, of Births, and of Deaths; with the estimated Population at the middle of each Year.

Year.	Persons Married.	Births.	Deaths.	Population.	Year.	Persons Married.	Births.	Deaths.	Population.
1838 -	1,068	1,815	1,180	47,761	1864 -	1,950	3,114	2,047	75,922
1839 -	1,120	2,024	1,289	48,842	1865 -	1,992	3,226	1,965	78,516
1840 -	904	1,967	1,730	49,951	1866 -	2,026	3,412	1,895	81,197
1841 -	1,048	1,972	1,358	51,031	1867 -	1,862	3,498	2,065	83,970
1842 -	986	1,942	1,438	51,933	1868 -	1,964	3,588	2,445	86,837
1843 -	1,160	2,035	1,254	52,851	1869 -	1,898	3,760	2,299	89,804
1844 -	1,196	2,087	1,473	53,786	1870 -	1,972	3,799	2,539	92,873
1845 -	1,316	2,197	1,689	54,737	1871 -	2,210	3,982	2,498	95,823
1846 -	1,170	2,213	1,643	55,707	1872 -	2,348	4,162	2,648	98,251
1847 -	1,066	2,005	1,437	56,696	1873 -	2,418	4,447	2,401	100,741
1848 -	1,204	2,003	1,487	57,705	1874 -	2,160	4,374	2,520	103,294
1849 -	1,268	2,171	1,689	58,736	1875 -	2,368	4,270	2,889	105,913
1850 -	1,438	2,239	1,413	59,788	1876 -	2,460	4,781	2,561	108,599
1851 -	1,282	2,437	1,554	60,760	1877 -	2,366	4,753	2,515	111,355
1852 -	1,412	2,387	1,773	61,467	1878 -	2,214	4,779	2,500	114,182
1853 -	1,424	2,283	1,680	62,181	1879 -	2,282	4,697	2,651	117,083
1854 -	1,284	2,457	1,580	62,903	1880 -	2,354	4,860	2,969	120,059
1855 -	1,218	2,301	1,498	63,624	1881 -	2,300	4,712	2,654	123,146
1856 -	1,288	2,402	1,361	64,366	1882 -	2,402	4,857	2,530	126,275
1857 -	1,342	2,441	1,796	65,119	1883 -	2,414	4,825	2,484	129,483
1858 -	1,288	2,276	1,894	65,885	1884 -	2,304	4,851	2,937	132,773
1859 -	1,504	2,518	1,638	66,663	1885 -	2,228	4,683	2,641	136,147
1860 -	1,336	2,567	1,381	67,456	1886 -	2,440	4,863	2,740	139,606
1861 -	1,276	2,540	1,733	68,638	1887 -	2,378	4,695	2,736	143,153
1862 -	1,512	2,723	1,660	70,986	1888 -	2,272	4,814	2,668	146,790
1863 -	1,890	2,937	2,199	73,413	1889 -	2,422	4,790	2,505	150,520

TABLE 23.

TABLE\* showing, for the Borough of Leicester for each of the Years 1838-89, the rate per 1,000 living of Persons Married, of Births, and of Deaths; with the Per-centage of registered Vaccinations to Births.†

Year.	Persons Married.	Births.	Deaths.	Per-centage of registered Vaccinations to Total Births.	Year.	Persons Married.	Births.	Deaths.	Per-centage of registered Vaccinations to Total Births.
1838 -	22·36	38·00	24·76	Not known. Returns incomplete.	1864 -	25·68	41·01	26·96	(140·4)‡
1839 -	22·90	41·44	26·39		1865 -	25·38	41·09	25·02	61·5
1840 -	18·10	39·37	34·63		1866 -	24·94	42·02	23·33	36·7
1841 -	20·52	38·64	26·61		1867 -	22·18	41·66	24·59	48·1
1842 -	18·98	37·39	28·07		1868 -	22·62	41·32	28·15	43·2
1843 -	20·18	38·52	23·72		1869 -	21·12	41·87	25·60	94·2
1844 -	22·22	38·80	27·38		1870 -	21·22	40·90	27·33	94·7
1845 -	24·04	40·14	30·85		1871 -	23·06	41·55	26·07	81·7
1846 -	21·00	39·72	29·48		1872 -	23·90	42·36	26·95	81·1
1847 -	18·80	35·36	25·69		1873 -	24·00	44·14	23·83	107·1
1848 -	20·86	34·71	25·77		1874 -	20·90	42·34	24·29	83·0
1849 -	21·58	36·96	28·73		1875 -	22·36	40·31	27·28	86·1
1850 -	24·04	37·45	23·64		1876 -	22·64	44·02	23·58	82·6
1851 -	21·11	40·11	25·57		1877 -	21·24	42·68	23·48	71·7
1852 -	22·96	38·83	28·84	74·2	1878 -	19·38	41·85	21·89	76·9
1853 -	22·90	36·71	27·02	55·3	1879 -	19·48	40·11	22·64	70·6
1854 -	20·40	39·06	25·11	53·0	1880 -	19·60	40·04	24·73	67·0
1855 -	19·14	36·16	23·55	68·6	1881 -	18·66	38·26	21·55	59·4
1856 -	20·02	37·32	21·16	80·7	1882 -	19·02	38·46	20·04	72·5
1857 -	20·60	37·48	27·58	92·6	1883 -	18·64	37·26	19·18	64·0
1858 -	19·24	34·54	28·76	77·0	1884 -	17·34	36·53	22·12	40·6
1859 -	22·56	37·77	24·57	88·9	1885 -	16·36	34·39	19·39	36·3
1860 -	19·80	38·05	20·47	57·5	1886 -	17·46	34·80	19·62	39·3
1861 -	18·58	37·01	25·25	68·9	1887 -	16·60	32·79	19·10	23·1
1862 -	21·30	38·37	23·38	63·4	1888 -	15·48	32·79	18·16	10·0
1863 -	25·74	40·00	29·95	50·9	1889 -	16·08	31·82	16·63	6·5
				54·7					3·6


\* See Diagram J.  
† For the actual number of annual vaccinations, see Table 51.  
‡ The "extra vaccinations," 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr John Thomas Biggs.)

DIAGRAM J. illustrating Table 23.


This diagram shows, (1) Percentage of registered vaccinations  
to total births ... ..


Red curve 

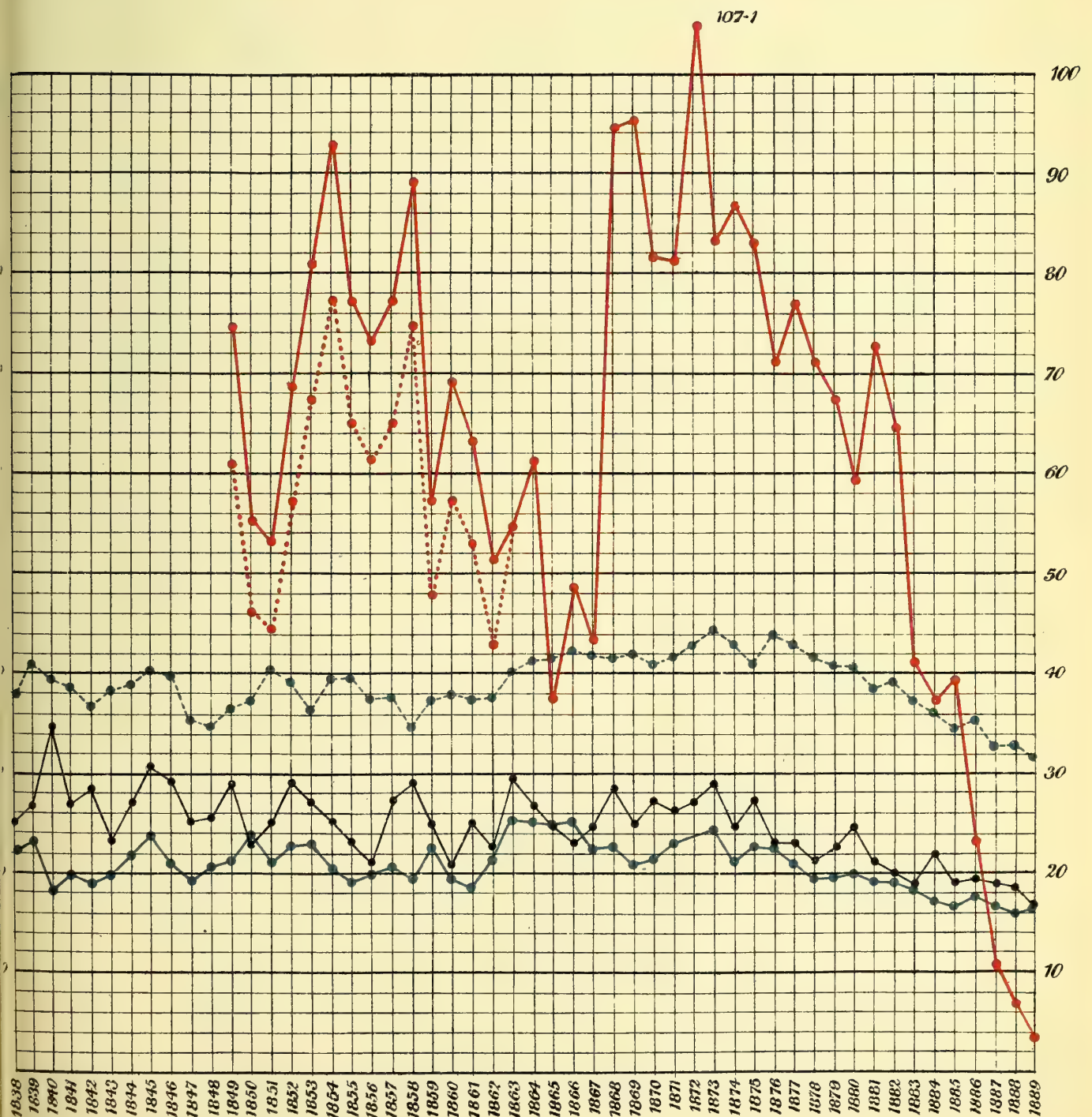
(2) Annual birth-rate per 1000 population ...

Dotted blue curve 

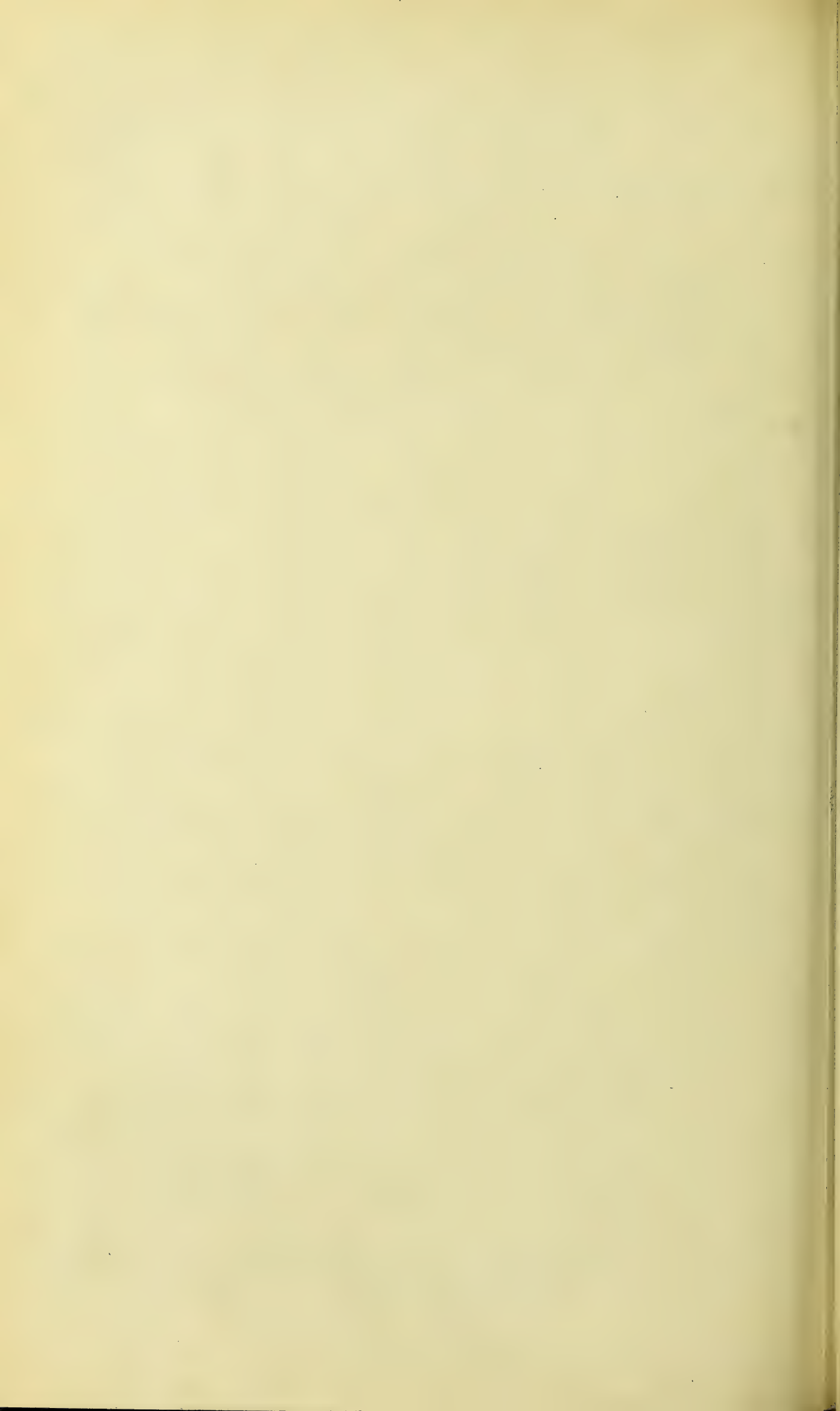
(3) Annual death-rate per 1000 population ... ..

Black curve 

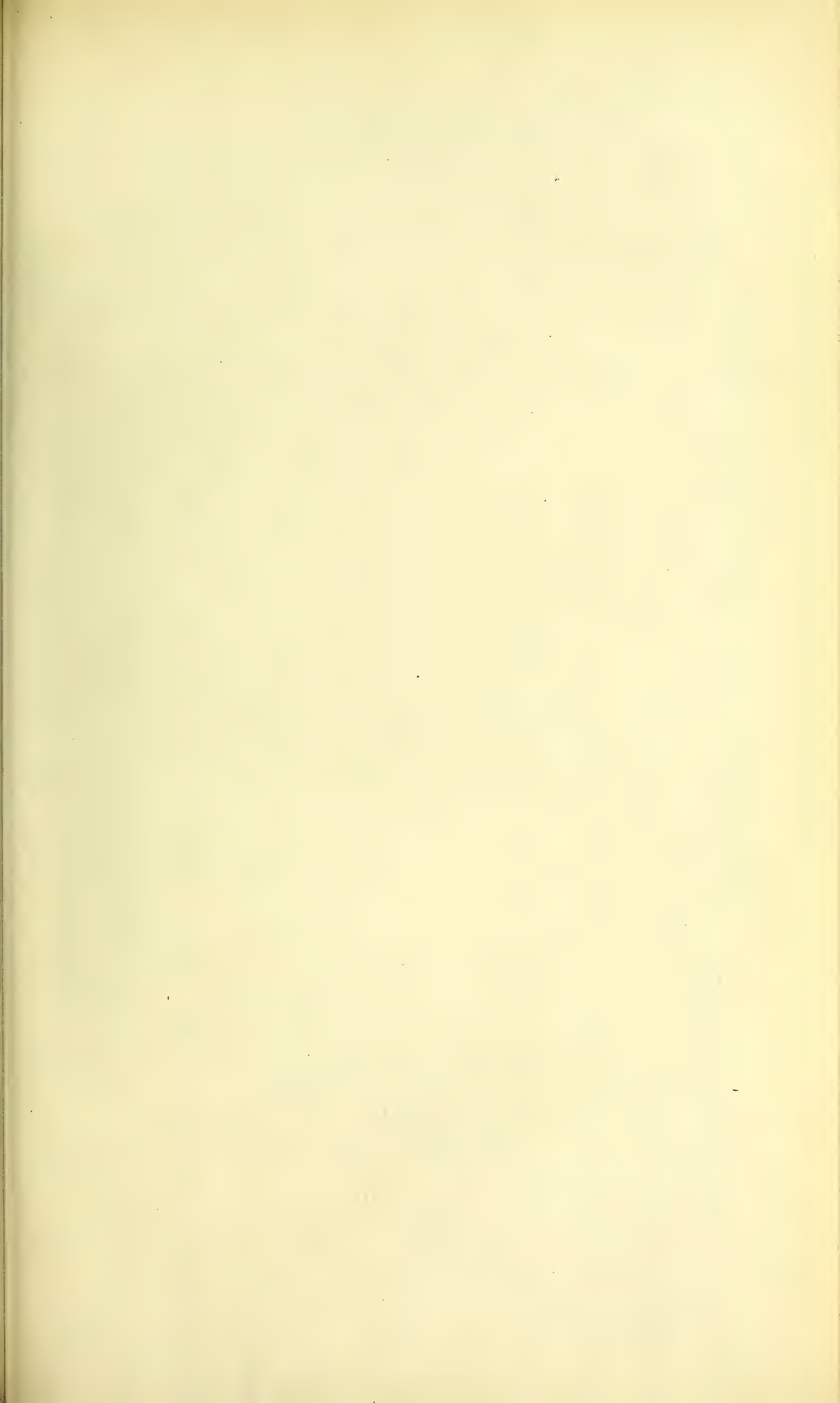
(4) Annual number of persons married per 1000 population Solid blue curve 













*This diagram shows in quinquennial periods, (1) That the highest average annual death-rate per 1000 living (since 1849, when vaccination became general) is coincident with the highest vaccination period (1868-72);*

*(2) That the lowest death-rate per 1000 living coincides with the general abandonment of vaccination (1883-89); and*

*(3) That the highest birth-rate per 1000 living, occurred in the period immediately succeeding the abnormal death-rate of 1868-72, notwithstanding a declining marriage-rate and death-rate, being a very suggestive fact in connexion with the previous increased infantile mortality.*

Red curve



Average annual vaccinations per 100,000 population (one fiftieth only shown to suit compass of diagram).

Dotted blue curve



Average annual birth-rate per 1000 population.

Black curve



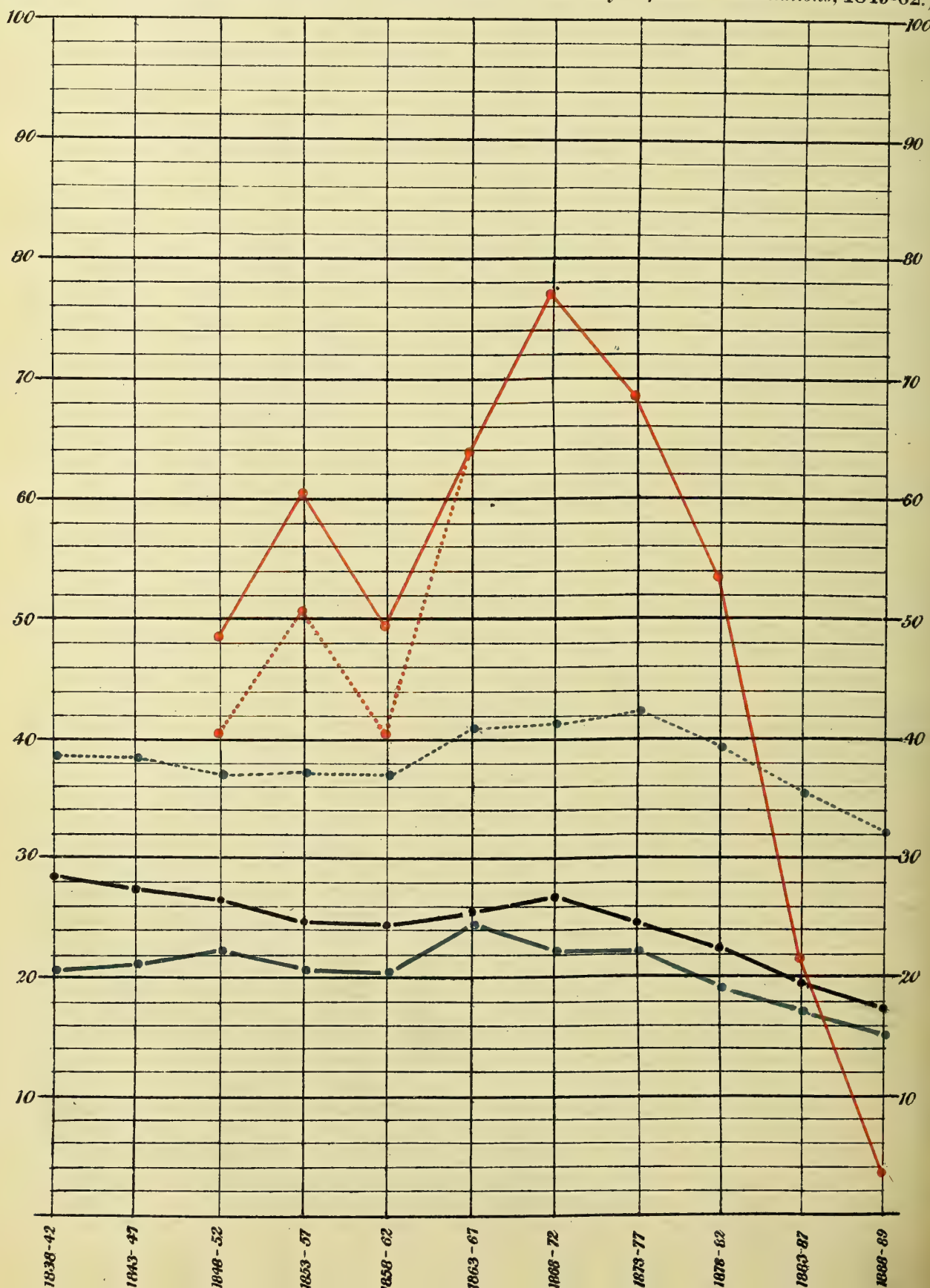
Average annual death-rate from all causes per 1000 population.

Blue curve



Average annual number of persons married per 1000 population.

(The space between the dotted and solid red curve shows the addition for private vaccinations, 1849-62.)





(Papers handed in by Mr. John Thomas Biggs.)

TABLE 24.

TABLE\* showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average annual registered Number and the average annual rate per 1,000 living of Persons Married, of Births, and of Deaths; with the average annual registered Vaccinations per 100,000 living.†

No.	Periods.	—	Persons Married.	Births.	Deaths.	Estimated Population for the middle of the Period.	Average Annual registered Vaccinations per 100,000 Population.
I.	1838-42	{ Average Annual Number Rate per 1,000 - -	1,025·2 20·58	1,944 38·96	1,403 28·09	49,951	No Returns.
II.	1843-47	{ Average Annual Number Rate per 1,000 - -	1,181·6 21·24	2,107·4 38·51	1,503·2 27·46		
III.	1848-52	{ Average Annual Number Rate per 1,000 - -	1,320· 22·10	2,247·4 37·61	1,583·2 26·51	59,788	2,398 (4 years)
IV.	1853-57	{ Average Annual Number Rate per 1,000 - -	1,311·2 20·62	2,376·8 37·35	1,583 24·88		
V.	1858-62	{ Average Annual Number Rate per 1,000 - -	1,383·2 20·30	2,524·8 37·15	1,661·2 24·48	67,456	2,434
VI.	1863-67	{ Average Annual Number Rate per 1,000 - -	1,944 24·78	3,237·4 41·15	2,034·2 25·97		
VII.	1868-72	{ Average Annual Number Rate per 1,000 - -	2,078·4 22·38	3,858·2 41·60	2,485·8 26·82	92,873	3,819
VIII.	1873-77	{ Average Annual Number Rate per 1,000 - -	2,354·4 22·22	4,525 42·69	2,577·2 24·49		
IX.	1878-82	{ Average Annual Number Rate per 1,000 - -	2,310·4 19·22	4,781 39·74	2,660·8 22·17	120,059	2,645
X.	1883-87	{ Average Annual Number Rate per 1,000 - -	2,352·8 17·28	4,783·4 35·15	2,707·6 19·88		
XI.	1888-89 (2 years)	{ Average Annual Number Rate per 1,000 - -	2,347 15·78	4,802 32·30	2,586·5 17·39	148,655	62 (2 years)

\* See Diagram K.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 25.

App. No. 3.

TABLE\* showing, for the Borough of Leicester during the years 1849-89, in Quinquennial Periods, the average annual per-centage of Primary Vaccinations to Births, and the average annual rate of such Vaccinations to 5,000 Births, to 100,000 Population, and to 250,000 Population respectively.

Period.	Total Number of registered Vaccinations for each Period.	Average Annual per- centage of registered Vaccinations to total Births.	Average Annual Rate of registered Vaccinations to 5,000 Births.	Average Annual Rate of registered Vaccinations to	
				100,000 Population.	250,000 Population.
1849-52 (4 years)	5,782	62·8	3,139	2,398	5,996
1853-57	9,537	78·9	3,948	3,006	7,515
1858-62	8,040	64·5	3,237	2,372	5,930
1863-67	11,849	74·5	3,717	3,070	7,678
1868-72	16,847	87·3	4,315	3,660	9,150
1873-77	17,879	79·1	3,906	3,380	8,450
1878-82	14,964	62·6	3,132	2,484	6,210
1883-87	6,146	25·7	1,283	897	2,249
1888-89 (2 years)	347	3·7	181	116	291

\* The numbers and rates given in this table have been calculated from the figures given at the foot of my Diagram A., in which for the most part prior to 1872, and since 1872 altogether, the vaccinations, whenever performed, were referred back to the year of birth. These rates have, however, not been used in any other of my tables or diagrams (except Diagram L., which illustrates this and Table 26); and this table has been prepared only for the purpose of comparison with Table 26.—J. T. B.

TABLE 26.

TABLE\* showing, for the Borough of Leicester during the years 1849-89, in Quinquennial Periods, the average annual per-centage of Vaccinations registered in each year to the Births registered in the same year, and the average annual rate of such Vaccinations to 5,000 Births, to 100,000 Population, and to 250,000 Population respectively.

Period.	Total Number of registered Vaccinations for each Period.	Average Annual per- centage of registered Vaccinations to total Births.	Average Annual Rate of registered Vaccinations to 5,000 Births.	Average Annual Rate of registered Vaccinations to	
				100,000 Population.	250,000 Population.
1849-52 (4 years)	5,782	62·8	3,139	2,398	5,996
1853-57	9,540	80·2	4,009	3,008	7,518
1858-62	8,241	65·9	3,297	2,434	6,084
1863-67	12,212†	76·9†	3,847†	3,175†	7,938†
1868-72	17,728	91·7	4,587	3,819	9,548
1873-77	18,062	80·0	4,002	3,401	8,503
1878-82	15,927	66·7	3,334	2,645	6,613
1883-87	7,156	29·9	1,494	1,059	2,648
1888-89 (2 years)	486	5·1	253	162	405

\* The numbers and rates given in this table have been calculated upon the number of actual primary vaccinations registered within each year, irrespective of the year of birth of the children vaccinated. (For a fuller explanation see the notes to my Table 51.) These numbers and rates are those used in my tables and diagrams, relating to the Borough of Leicester, other than Table 25 and Diagram A. See Diagram L., which illustrates this and Table 25.

† With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

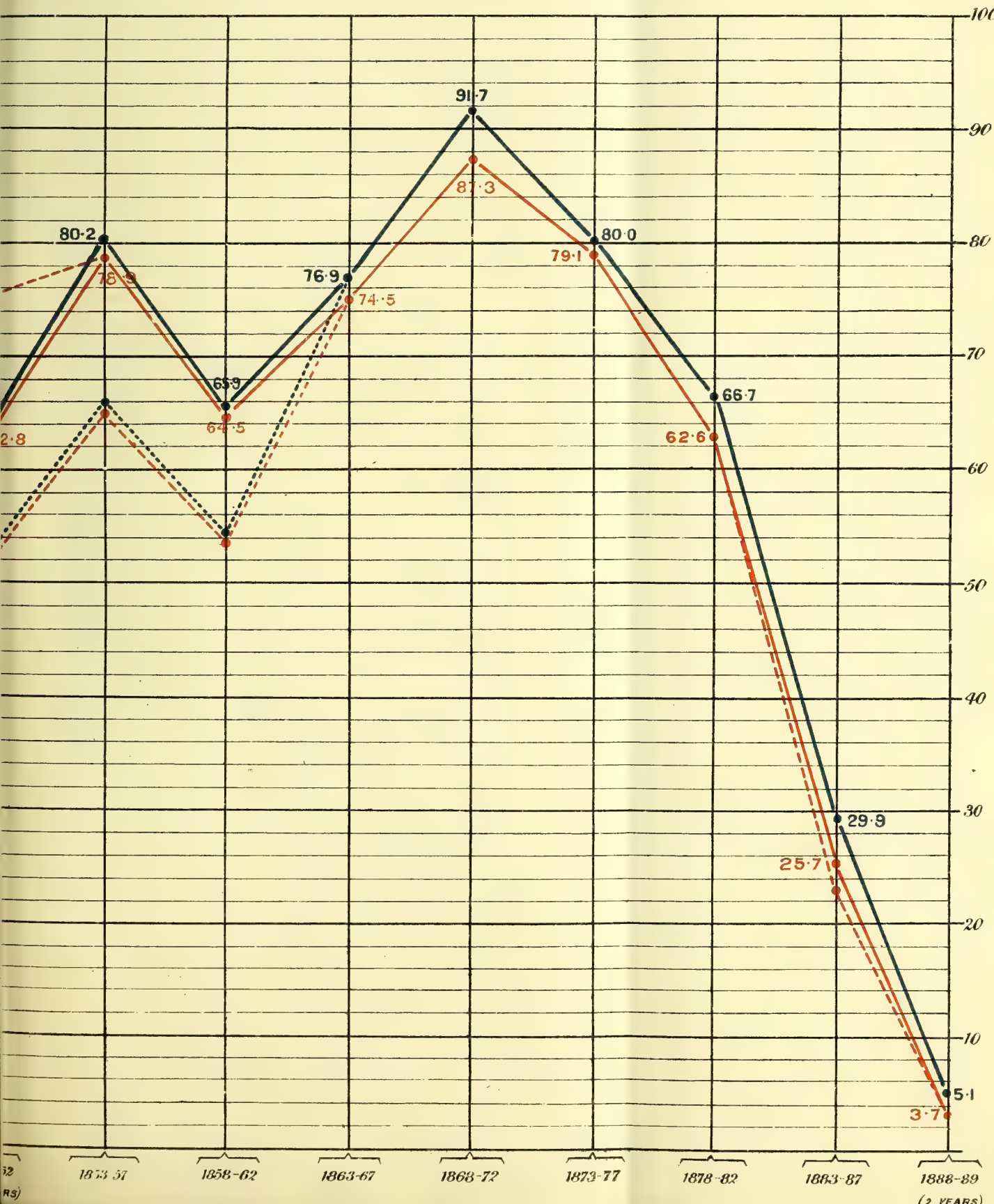
DIAGRAM L, illustrating Tables 25 and 26.

This diagram shows in quinquennial periods, 1849-89, (1) In the solid red curve, the average annual percentage of primary vaccinations to total births as calculated upon the figures in Diagram A, according to the official system of distribution, which system for the most part prior to 1872, and since 1872 altogether, refers the vaccinations whenever performed, back to the year of birth;

(2) In the solid blue curve, the average annual percentage of primary vaccinations to total births, as calculated upon the number of actual registered vaccinations within each year, irrespective of the year of birth; and

(3) The estimated amount added for private vaccinations from 1849 to 1862, which is represented by the space between the solid and dotted curves of each colour respectively.

NOTE.—This diagram was prepared in order to assist the Commission in comparing the two systems of dealing with the vaccinations, as represented by the solid red and blue curves described in paragraphs (1) and (2) of this diagram. The difference between the results of the calculations from the two systems is shown by the space between the solid red and blue curves; and it fully justifies the contention maintained before the Commission that the official figures were below the actual number of registered vaccinations occurring within each year; and consequently that they were to this extent defective. I have, therefore, prepared all the vaccination curves on my diagrams upon the same basis as that of the blue curve, described by the above paragraph (2). The actual number of annual vaccinations used, will be found in Table 51 J.T.P.









(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 27.

TABLE showing, for the Borough of Leicester for each of the Years 1838-89, the registered number of Deaths from all Causes at all Ages and at certain life-periods.

Year.	0-3 Months.	3-6 Months.	6-12 Months.	1-5 Years.	5-10 Years.	10-15 Years.	15 + Years.	Total for all ages.
1838	131	63	133	145	29	38	641	1,180
1839	178	80	124	149	48	31	679	1,289
1840	221	72	55	480	104	37	761	1,730
1841	172	57	125	225	78	49	652	1,358
1842	214	69	28	276	49	24	798	1,458
1843	169	59	100	259	38	16	613	1,254
1844	236	66	39	270	71	32	759	1,473
1845	236	73	152	434	91	33	670	1,689
1846	271	93	133	241	53	128	724	1,643
1847	202	96	112	248	37	27	735	1,457
1848	237	62	141	278	48	39	682	1,487
1849	268	84	146	316	58	36	781	1,689
1850	229	72	110	236	33	36	697	1,413
1851	251	84	147	241	55	26	750	1,554
1852	227	142	160	384	75	39	746	1,773
1853	264	84	135	297	48	35	817	1,680
1854	247	100	124	345	41	26	697	1,580
1855	194	105	114	192	42	21	830	1,498
1856*	211	111	131	208	28	24	648	1,361
1857	245	113	179	436	72	35	716	1,796
1858	235	109	162	468	124	33	763	1,894
1859	247	108	147	361	51	30	694	1,638
1860	256	94	100	152	25	28	726	1,381
1861	237	113	180	367	48	17	771	1,733
1862	261	120	151	238	49	29	812	1,660
1863	269	159	193	578	106	45	849	2,199
1864	332	143	186	329	65	33	959	2,047
1865	327	145	202	362	44	26	859	1,965
1866	324	189	187	248	40	29	878	1,895
1867	354	200	238	298	32	31	912	2,065
1868	426	219	276	513	52	45	914	2,445
1869	355	237	270	349	39	37	1,012	2,299
1870	400	219	275	525	105	52	963	2,539
1871	416	261	287	397	69	30	1,038	2,498
1872	428	296	237	386	120	38	1,143	2,648
1873	370	243	315	402	46	31	994	2,401
1874	438	197	329	288	57	44	1,167	2,520
1875	449	221	364	549	82	50	1,174	2,889
1876	414	228	314	452	77	135	941	2,561
1877	389	194	314	358	57	29	1,174	2,515
1878	435	224	322	389	45	38	1,047	2,500
1879	396	189	176	386	53	14	1,437	2,651
1880	447	243	380	657	107	32	1,103	2,969
1881	380	216	369	409	108	45	1,127	2,654
1882	396	244	302	355	60	29	1,144	2,530
1883	401	215	297	358	56	28	1,129	2,484
1884	432	306	395	482	68	36	1,218	2,937
1885	353	237	317	436	69	22	1,207	2,641
1886	401	266	385	331	58	22	1,277	2,740
1887	372	238	401	396	58	24	1,247	2,736
1888	399	228	353	355	55	24	1,254	2,668
1889	407	259	294	277	52	30	1,186	2,505

\* In 1856 the deaths were first corrected for the inmates of public institutions. Prior to this date the deaths of inmates not belonging to the Borough were included in the number registered for the Borough, and added to the death-rate. The Registrar-General still includes these; but they are excluded locally, and others which occur in Borough institutions outside the Borough are added.—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 28.

TABLE showing, for the Borough of Leicester for each of the Years 1838-89, the Death-rate from all Causes per 1,000 living at all Ages and at certain life-periods, with for each of the Years 1849-89 the Per-centage of registered Vaccinations to Births.\*

Year.	0-3 Months.	3-6 Months.	6-12 Months.	1-5 Years.	5-10 Years.	10-15 Years.	15 + Years.	Total for all ages.	Per-centage of Registered Vaccinations to Total Births.
1838	2.75	1.32	2.79	3.04	0.61	0.79	13.46	24.76	} Not known.
1839	3.65	1.64	2.54	3.04	0.98	0.63	13.91	26.39	
1840	4.42	1.44	1.10	9.62	2.28	0.54	15.23	34.63	
1841	3.37	1.12	2.47	4.19	1.72	0.96	12.78	26.61	
1842	4.13	1.33	0.54	5.30	0.94	0.46	15.37	28.07	
1843	3.19	1.12	1.89	4.89	0.72	0.31	11.60	23.72	} Returns in- complete.
1844	4.39	1.23	0.72	5.01	1.32	0.60	14.11	27.38	
1845	4.31	1.33	2.79	7.85	1.70	0.63	12.24	30.85	
1846	4.86	1.67	2.39	4.32	0.95	2.30	12.99	29.48	
1847	3.58	1.68	1.98	4.37	0.65	0.47	12.96	25.69	
1848	4.11	1.07	2.44	4.82	0.83	0.68	11.82	25.77	—
1849	4.56	1.43	2.48	5.36	0.99	0.61	13.30	28.73	74.2
1850	3.83	1.21	1.84	3.95	0.55	0.60	11.66	23.64	55.3
1851	4.13	1.38	2.42	3.96	0.91	0.42	12.35	25.57	53.0
1852	3.69	2.31	2.61	6.24	1.22	0.63	12.14	28.84	68.6
1853	4.28	1.32	2.17	4.78	0.77	0.56	13.14	27.02	80.7
1854	3.93	1.59	1.97	5.51	0.62	0.41	11.08	25.11	92.6
1855	3.07	1.63	1.80	3.02	0.66	0.33	13.04	23.55	76.9
1856	3.28	1.73	2.04	3.24	0.43	0.37	10.07	21.16	73.7
1857	3.76	1.73	2.75	6.70	1.10	0.54	11.00	27.58	77.0
1858	3.57	1.65	2.46	7.11	1.88	0.50	11.59	28.76	88.9
1859	3.71	1.62	2.21	5.42	0.76	0.45	10.40	24.57	57.5
1860	3.79	1.40	1.48	2.25	0.37	0.42	10.76	20.47	68.9
1861	3.45	1.64	2.62	5.09	0.96	0.19	11.30	25.25	63.4
1862	3.69	1.70	2.12	3.35	0.69	0.41	11.42	23.38	50.9
1863	3.66	2.17	2.63	7.87	1.43	0.75	11.44	29.95	54.7 (140.4†)
1864	4.39	1.88	2.45	4.33	0.86	0.44	12.61	26.96	61.5
1865	4.17	1.84	2.58	4.62	0.52	0.33	10.96	25.02	36.7
1866	4.00	2.34	2.26	3.07	0.50	0.36	10.80	23.33	48.1
1867	4.21	2.40	2.83	3.55	0.38	0.36	10.86	24.59	43.2
1868	4.90	2.50	3.19	5.92	0.60	0.52	10.52	28.15	94.2
1869	3.96	2.64	3.00	3.88	0.44	0.41	11.27	25.60	94.7
1870	4.31	2.35	2.97	5.66	1.12	0.55	10.37	27.33	81.7
1871	4.34	2.72	3.00	4.14	0.73	0.32	10.82	26.07	81.8
1872	4.25	3.12	2.42	3.93	1.22	0.38	11.63	26.95	107.1
1873	3.67	2.40	3.13	3.98	0.46	0.30	9.89	23.83	83.0
1874	4.21	1.89	3.18	2.77	0.56	0.41	11.27	24.29	86.1
1875	4.24	2.09	3.43	5.18	0.78	0.48	11.08	27.28	82.6
1876	3.81	2.09	2.90	4.16	0.71	1.25	8.66	23.58	71.7
1877	3.49	1.74	2.82	3.22	0.51	0.26	11.44	23.48	76.9
1878	3.79	1.97	2.82	3.40	0.40	0.34	9.17	21.89	70.6
1879	3.39	1.60	1.50	3.30	0.45	0.12	12.28	22.64	67.0
1880	3.71	2.03	3.16	5.48	0.88	0.27	9.20	24.73	59.4
1881	3.09	1.76	3.00	3.32	0.87	0.36	9.15	21.55	72.5
1882	3.14	1.93	2.39	2.81	0.48	0.23	9.06	20.04	64.0
1883	3.09	1.66	2.29	2.76	0.43	0.22	8.73	19.18	40.6
1884	3.25	2.31	2.98	3.63	0.51	0.27	9.17	22.12	36.3
1885	2.66	1.67	2.33	3.07	0.64	0.16	8.86	19.39	39.3
1886	2.87	1.90	2.76	2.37	0.42	0.16	9.14	19.62	23.1
1887	2.60	1.66	2.80	2.77	0.40	0.17	8.70	19.10	10.0
1888	2.72	1.55	2.40	2.42	0.37	0.16	8.54	18.16	6.5
1889	2.70	1.72	1.95	1.84	0.35	0.20	7.87	16.63	3.6

\* For the actual number of annual vaccinations, see Table 51.  
† The "extra vaccinations" 1863-64. (See Table 6.)—J.T.B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No 3.

TABLE 29.

TABLE showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average annual registered Number of Deaths from all Causes at all Ages and at certain life-periods, with the average annual Per-centage of registered Vaccinations to Births.\*

No.	Period.	Under 3 Months.	3-6 Months.	6-12 Months.	1-5 Years.	5-10 Years.	10-15 Years.	15 + Years.	Total for all Ages.	Average Annual Per-centage of Vaccina- tions to Total Births.
I.	1838-42	183·2	68·2	93·0	255·0	61·6	35·8	706·2	1403·0	Not known.
II.	1843-47	222·8	77·4	107·2	290·4	58·0	47·2	700·2	1503·2	Returns in- complete.
III.	1848-52	242·4	88·8	140·8	291·0	538·0	35·2	731·2	1583·2	62·8 (4 yrs.)
IV.	1853-57	232·2	102·6	136·6	295·6	46·2	28·2	741·6	1583·0	80·2
V.	1858-62	247·2	108·8	148·0	317·2	59·4	27·4	753·2	1161·2	65·9
VI.	1863-67	321·2	167·2	201·2	363·0	57·4	32·8	891·4	2034·2	76·9†
VII.	1868-72	405·0	246·4	269·0	434·0	77·0	40·4	1014·0	2485·8	91·7
VIII.	1873-77	412·0	216·6	327·2	409·8	63·8	57·8	1090·0	2577·2	80·0
IX.	1878-82	410·8	223·2	309·8	439·2	74·6	31·6	1171·6	2660·8	66·7
X.	1883-87	391·8	252·4	359·0	400·6	61·8	26·4	1215·6	2707·6	29·9
XI.	1888-89 (2 years)	403·0	243·5	323·5	316·0	53·5	27·0	1220·0	2586·5	5·1

\* For the actual number of annual vaccinations, see Table 51.

† With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.

TABLE 30.

TABLE showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average annual Death-rate from all Causes per 1,000 living at all Ages and at certain life-periods, with the average annual Per-centage of registered Vaccinations to Births.\*

No.	Period.	Under 3 Months.	3-6 Months.	6-12 Months.	1-5 Years.	5-10 Years.	10-15 Years.	15 + Years.	Total for all Ages.	Average Annual Per-centage of Vaccina- tions to Total Births.
I.	1838-42	3·66	1·37	1·89	5·04	1·31	0·67	14·15	28·09	Not known.
II.	1843-47	4·07	1·41	1·96	5·32	1·05	0·86	12·79	27·46	Returns in- complete.
III.	1848-52	4·06	1·48	2·36	4·87	0·90	0·59	12·25	26·51	62·8 (4 yrs.)
IV.	1853-57	3·66	1·60	2·14	4·65	0·71	0·44	11·68	24·88	80·2
V.	1858-62	3·64	1·60	2·18	4·64	0·93	0·40	11·09	24·48	65·9
VI.	1863-67	4·09	2·13	2·55	4·69	0·74	0·45	11·32	25·97	76·9†
VII.	1868-72	4·35	2·67	2·92	4·71	0·82	0·43	10·92	26·82	91·7
VIII.	1873-77	3·88	2·04	3·08	3·85	0·64	0·53	10·47	24·49	80·0
IX.	1878-82	3·43	1·86	2·57	3·66	0·62	0·26	9·77	22·17	66·7
X.	1883-87	2·89	1·84	2·63	2·93	0·48	0·19	8·92	19·88	29·9
XI.	1888-89 (2 years)	2·72	1·63	2·18	2·13	0·36	0·18	8·20	17·39	5·1

\* For the actual number of annual vaccinations, see Table 51.

† With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



*(Papers handed in by Mr. John Thomas Biggs.)*

TABLE 31.

TABLE showing, for the Borough of Leicester for each of the Years 1838-89, the registered Number of Deaths from all Causes, at all and under certain Ages.

Year	Under 3 Months.	Under 6 Months.	Under 12 Months.	Under 5 Years.	Under 10 Years.	Under 15 Years.	Total all Ages.
1838	131	194	327	472	501	539	1,180
1839	178	258	382	531	579	610	1,289
1840	221	293	348	828	932	969	1,730
1841	172	229	354	579	657	706	1,358
1842	214	283	311	587	636	660	1,458
1843	169	228	328	587	625	641	1,254
1844	236	302	341	611	682	714	1,473
1845	236	309	461	895	986	1,019	1,689
1846	271	364	497	738	791	919	1,643
1847	202	298	410	658	695	722	1,457
1848	237	299	440	718	766	805	1,487
1849	268	352	498	814	872	908	1,689
1850	229	301	411	647	680	716	1,413
1851	251	335	482	723	778	804	1,554
1852	227	369	529	913	988	1,027	1,773
1853	264	348	483	780	828	863	1,680
1854	247	347	471	816	857	883	1,589
1855	194	299	413	605	647	668	1,498
1856	211	322	453	661	689	713	1,361
1857	245	358	537	973	1,045	1,080	1,796
1858	235	344	506	974	1,098	1,131	1,894
1859	247	355	502	863	914	944	1,638
1860	256	350	450	602	627	655	1,381
1861	237	350	530	879	945	962	1,733
1862	261	381	532	770	819	848	1,660
1863	269	428	621	1,199	1,305	1,350	2,199
1864	332	475	661	990	1,055	1,088	2,047
1865	327	472	674	1,036	1,080	1,106	1,965
1866	324	513	700	948	988	1,017	1,895
1867	354	554	792	1,090	1,122	1,153	2,065
1868	426	645	921	1,434	1,486	1,531	2,445
1869	355	592	862	1,211	1,250	1,287	2,299
1870	400	619	894	1,419	1,524	1,576	2,539
1871	416	677	964	1,361	1,430	1,460	2,498
1872	428	724	961	1,347	1,467	1,505	2,648
1873	370	613	928	1,330	1,376	1,407	2,401
1874	438	635	964	1,252	1,309	1,353	2,520
1875	449	670	1,034	1,583	1,665	1,715	2,889
1876	414	642	956	1,408	1,485	1,620	2,561
1877	389	583	897	1,255	1,312	1,341	2,515
1878	435	659	981	1,370	1,415	1,453	2,500
1879	396	585	761	1,147	1,200	1,214	2,651
1880	447	690	1,070	1,727	1,834	1,866	2,969
1881	380	596	965	1,374	1,482	1,527	2,654
1882	396	640	942	1,297	1,357	1,386	2,530
1883	401	616	913	1,271	1,327	1,355	2,484
1884	432	738	1,133	1,615	1,683	1,719	2,937
1885	353	590	907	1,343	1,412	1,434	2,641
1886	401	667	1,052	1,383	1,441	1,463	2,740
1887	372	610	1,011	1,407	1,465	1,489	2,736
1888	399	627	980	1,335	1,390	1,414	2,668
1889	407	666	960	1,237	1,289	1,319	2,505



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 32.

TABLE showing, for the Borough of Leicester for each of the Years 1838-89, the Death-rate from all Causes per 1,000 living, at all and under certain Ages, with for each of the Years 1849-89 the Per-centage of registered Vaccinations to Births.\*

Year.	Under 3 Months.	Under 6 Months.	Under 12 Months.	Under 5 Years.	Under 10 Years.	Under 15 Years.	Total All Ages.	Per-centage of registered Vaccinations to Total Births.
1838	2.75	4.07	6.86	9.90	10.51	11.30	24.76	Not known.
1839	3.65	5.29	7.83	10.87	11.85	12.48	26.39	
1840	4.42	5.86	6.96	16.58	18.86	19.40	34.63	
1841	3.37	4.49	6.96	11.15	12.87	13.83	26.61	
1842	4.13	5.46	6.00	11.39	12.24	12.70	28.07	
1843	3.19	4.31	6.20	11.09	11.81	12.12	23.72	Returns incomplete.
1844	4.39	5.62	6.34	11.35	12.67	13.27	27.38	
1845	4.31	5.64	8.43	16.28	17.98	18.61	30.85	
1846	4.86	6.53	8.92	13.24	14.19	16.49	29.48	
1847	3.58	5.25	7.24	11.60	12.26	12.73	25.69	
1848	4.11	5.18	7.62	12.45	13.28	13.95	25.77	—
1849	4.56	5.99	8.47	13.83	14.82	15.43	28.73	74.2
1850	3.83	5.04	6.88	10.83	11.33	11.98	23.64	55.3
1851	4.13	5.51	7.93	11.89	12.80	13.22	25.57	53.0
1852	3.69	6.00	8.61	14.85	16.07	16.70	28.84	68.6
1853	4.28	5.60	7.77	12.55	13.32	13.88	27.02	80.7
1854	3.92	5.51	7.49	13.00	13.62	14.03	25.11	92.6
1855	3.07	4.70	6.50	9.52	10.18	10.51	23.55	76.9
1856	3.28	5.01	7.05	10.29	10.72	11.09	21.16	73.7
1857	3.76	5.49	8.24	14.94	16.04	16.58	27.58	77.0
1858	3.57	5.22	7.68	14.79	16.67	17.17	28.76	88.9
1859	3.71	5.33	7.54	12.96	13.72	14.17	24.57	57.5
1860	3.79	5.19	6.67	8.92	9.29	9.71	20.47	68.9
1861	3.45	5.09	7.71	12.80	13.76	13.95	25.25	63.4
1862	3.69	5.39	7.51	10.86	11.55	11.96	23.38	50.9
1863	3.66	5.83	8.46	16.33	17.76	18.51	29.95	54.7(140.4†
1864	4.39	6.27	8.72	13.05	13.91	14.35	26.96	61.5
1865	4.17	6.01	8.59	13.21	13.73	14.06	25.02	36.7
1866	4.00	6.34	8.60	11.67	12.17	12.53	23.33	48.1
1867	4.21	6.61	9.44	12.99	13.37	13.73	24.59	43.2
1868	4.90	7.40	10.59	16.51	17.11	17.63	28.15	94.2
1869	3.96	6.60	9.60	13.48	13.92	14.33	25.60	94.7
1870	4.31	6.66	9.63	15.29	16.41	16.96	27.33	81.7
1871	4.34	7.06	10.06	14.20	14.93	15.25	26.07	81.1
1872	4.25	7.37	9.79	13.72	14.94	15.32	26.95	107.1
1873	3.67	6.07	9.20	13.18	13.64	23.94	23.83	83.0
1874	4.21	6.10	9.28	12.05	12.61	13.02	24.29	86.1
1875	4.24	6.33	9.76	14.94	15.72	16.20	27.28	82.6
1876	3.81	5.90	8.80	12.96	13.67	14.92	23.58	71.7
1877	3.49	5.23	8.05	11.27	11.78	12.04	23.48	76.9
1878	3.79	5.76	8.58	11.98	12.38	12.72	21.89	70.6
1879	3.39	4.99	6.49	9.79	10.24	10.36	22.64	67.0
1880	3.71	5.74	8.90	14.38	15.26	15.53	24.73	59.4
1881	3.09	4.84	7.84	11.16	12.04	12.40	21.55	72.5
1882	3.14	5.07	7.46	10.27	10.75	10.98	20.64	64.0
1883	3.09	4.76	7.05	9.82	10.25	10.45	19.18	40.9
1884	3.25	5.56	8.53	12.16	12.68	12.95	22.12	36.3
1885	2.67	4.34	6.66	9.73	10.37	10.53	19.40	39.3
1886	2.87	4.78	7.54	9.91	10.32	10.48	19.62	23.1
1887	2.60	4.26	7.06	9.83	10.23	10.40	19.10	10.0
1888	2.72	4.27	6.67	9.09	9.47	9.62	18.16	6.5
1889	2.70	4.42	6.37	8.22	8.56	8.76	16.63	3.6

\* For the actual number of annual vaccinations, see Table 51.

† The "extra vaccinations," 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.

TABLE 33.

TABLE showing, for the Borough of Leicester during the years 1838-89, in quinquennial periods, the average annual registered number of Deaths from all causes, at all and under certain Ages, with the estimated Population at the Middle of each Period.

No.	Period.	Under 3 Months.	Under 6 Months.	Under 12 Months.	Under 5 Years.	Under 10 Years.	Under 15 Years.	Over 15 Years.	Totals for all Ages.	Population for the Middle of each Period.
I.	1838-42	183·2	251·4	344·4	599·4	661·0	696·8	706·2	1403·0	49,951
II.	1843-47	222·8	300·2	407·4	697·8	755·8	803·0	700·2	1503·2	54,737
III.	1848-52	242·4	331·2	472·0	763·0	816·8	852·0	731·2	1583·2	59,788
IV.	1853-57	232·2	334·8	471·4	767·0	813·2	841·4	741·6	1583·0	63,624
V.	1858-62	247·2	356·0	504·0	821·2	880·6	908·0	753·2	1661·2	67,456
VI.	1863-67	321·2	488·4	689·6	1052·6	1110·0	1142·8	891·4	2034·2	78,516
VII.	1868-72	405·0	651·4	920·4	1354·4	1431·4	1471·8	1014·0	2485·8	92,873
VIII.	1873-77	412·0	628·6	955·8	1365·6	1429·4	1487·2	1090·0	2577·2	105,913
IX.	1878-82	410·8	634·0	943·8	1383·0	1457·6	1489·2	1171·6	2660·8	120,059
X.	1883-87	391·8	644·2	1003·2	1403·8	1465·6	1492·0	1215·6	2707·6	136,147
XI.	1888-89 (2 years)	403·0	646·5	970·0	1286·0	1339·5	1366·5	1220·0	2586·5	148,655

TABLE 34.

TABLE\* showing, for the Borough of Leicester during the years 1838-89, in quinquennial periods, the average annual Death-rate from all causes per 1,000 living, at all and under certain Ages, with the average annual per-centage of registered Vaccinations to Births†.

No.	Period.	Under 3 Months.	Under 6 Months.	Under 12 Months.	Under 5 Years.	Under 10 Years.	Under 15 Years.	Over 15 Years.	Totals for all Ages.	Average Annual Per-centage of Vaccina- tions to Total Births.
I.	1838-42	3·66	5·03	6·92	11·96	13·27	13·94	14·15	28·09	Not known.
II.	1843-47	4·07	5·48	7·44	12·76	13·81	14·67	12·79	27·46	{ Returns incomplete  62·8 (4 years)
III.	1848-52	4·06	5·54	7·90	12·77	13·67	14·26	12·25	26·51	
IV.	1853-57	3·66	5·26	7·40	12·05	12·76	13·20	11·68	24·88	80·2
V.	1858-62	3·64	5·24	7·42	12·06	12·99	13·39	11·09	24·48	65·9
VI.	1863-67	4·09	6·22	8·77	13·46	14·20	14·65	11·32	25·97	76·9‡
VII.	1868-72	4·35	7·02	9·94	14·65	15·47	15·90	10·92	26·82	91·7
VIII.	1873-77	3·88	5·92	9·00	12·85	13·49	14·02	10·47	24·49	80·1
IX.	1878-82	3·43	5·29	7·86	11·52	12·13	12·40	9·77	22·17	66·7
X.	1883-87	2·89	4·73	7·36	10·28	10·76	10·96	8·92	19·88	29·9
XI.	1888-89 (2 years)	2·71	4·34	6·52	8·64	9·00	9·19	8·20	17·39	5·1

\* See Diagram M.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by M<sup>r</sup>. John Thomas Biggs.)

DIAGRAM M. illustrating Table 34.

This diagram shows, (1) The average annual death-rate from all causes per 1000 total population, with the relative proportion of death rates at each enumerated age (in separate colours, exclusively) in quinquennial periods, 1838-89

(2) The total death-rates under each age, inclusive, measuring from the base line of the diagram to the upper edge of each colour;

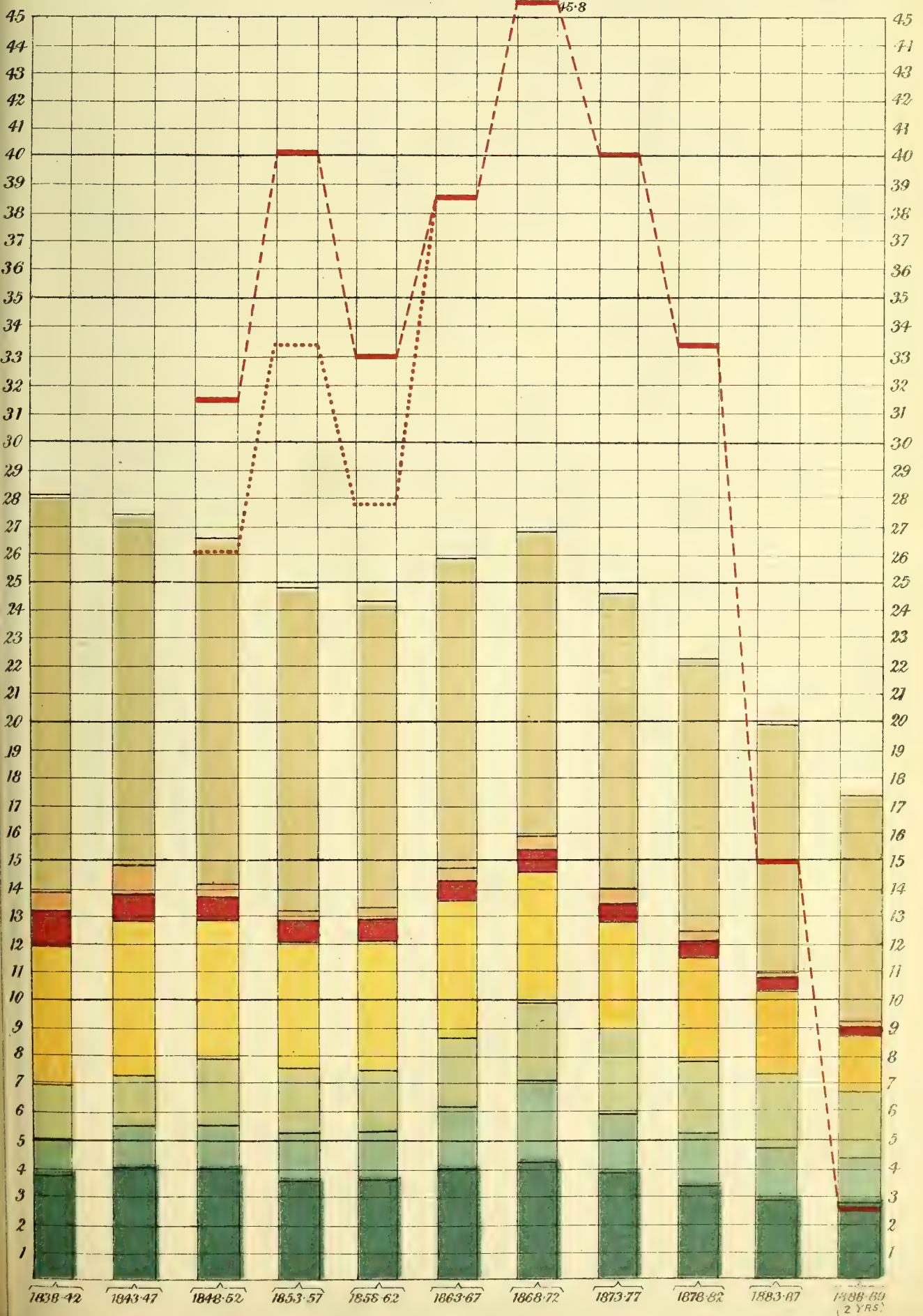
(3) That the decline in the death-rate (due to sanitary improvements) is checked, and a considerable increase of the death-rate corresponds with the period of more rigorous enforcement of vaccination, 1868-72; and,

(4) An emphatic decline in the general death-rate, and especially in the younger ages, as the practice of vaccination declines.

Deaths under 3 months.    Deaths 3 to 6 months.    Deaths 6 to 12 months.    Deaths 1 to 5 years.  
Deaths 5 to 10 years.    Deaths 10 to 15 years.    Deaths over 15 years.

~~~~~ Average annual percentage of registered vaccinations to total births (50 per cent. only shown to suit compass of the diagram.)

(Space between the solid and dotted curve shows the addition for private vaccinations, 1849-62.)









(Papers handed in by Mr. John Thomas Biggs.)

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TABLE 35.

TABLE showing, for the Borough of Leicester during the years 1838-89, in quinquennial periods, the average annual registered number of Deaths with the average annual Death-rate from all causes per 1,000 living, at all and under and over certain Ages, and the average annual Per-centage of registered Vaccinations to Births.\*

| No.   | Periods.                               | Under<br>1 Year. | Over<br>1 Year. | Under<br>5 Years. | Over<br>5 Years. | Under<br>10<br>Years. | Over<br>10<br>Years. | Under<br>15<br>Years. | Over<br>15<br>Years. | Totals<br>for all<br>Ages. | Average<br>Annual<br>Per-centage<br>of Vaccina-<br>tions to total<br>Births. |
|-------|----------------------------------------|------------------|-----------------|-------------------|------------------|-----------------------|----------------------|-----------------------|----------------------|----------------------------|------------------------------------------------------------------------------|
| I.    | 1838-42 { Deaths<br>Rates              | 344·4<br>6·92    | 1058·6<br>21·17 | 599·4<br>11·96    | 803·6<br>16·13   | 661·0<br>13·27        | 742·0<br>14·82       | 696·8<br>13·94        | 706·2<br>14·15       | 1403·0<br>28·09            | } Not known.                                                                 |
| II.   | 1843-47 { Deaths<br>Rates              | 407·4<br>7·44    | 1095·8<br>20·02 | 697·8<br>12·76    | 805·4<br>14·70   | 755·8<br>13·81        | 747·4<br>13·65       | 803·0<br>14·67        | 700·2<br>12·79       | 1503·2<br>27·46            |                                                                              |
| III.  | 1848-52 { Deaths<br>Rates              | 472·0<br>7·90    | 1111·2<br>18·61 | 763·0<br>12·77    | 820·2<br>13·74   | 816·8<br>13·67        | 766·4<br>12·84       | 852·0<br>14·26        | 731·2<br>12·25       | 1583·2<br>26·51            | } 62·8<br>(4 years).                                                         |
| IV.   | 1853-57 { Deaths<br>Rates              | 471·4<br>7·40    | 1111·6<br>17·48 | 767·0<br>12·05    | 816·0<br>12·83   | 813·2<br>12·76        | 769·8<br>12·12       | 841·4<br>13·20        | 741·6<br>11·68       | 1583·0<br>24·88            |                                                                              |
| V.    | 1858-62 { Deaths<br>Rates              | 504·0<br>7·42    | 1157·2<br>17·06 | 821·2<br>12·06    | 840·0<br>12·42   | 880·6<br>12·99        | 780·6<br>11·49       | 908·0<br>13·39        | 753·2<br>11·09       | 1661·2<br>24·48            | } 65·9                                                                       |
| VI.   | 1863-67 { Deaths<br>Rates              | 689·6<br>8·77    | 1344·6<br>17·20 | 1052·6<br>13·46   | 981·6<br>12·51   | 1110·0<br>14·20       | 924·2<br>11·77       | 1142·8<br>14·65       | 891·4<br>11·32       | 2034·2<br>25·97            |                                                                              |
| VII.  | 1868-72 { Deaths<br>Rates              | 920·4<br>9·94    | 1565·4<br>16·38 | 1354·4<br>14·65   | 1131·4<br>12·17  | 1431·4<br>15·47       | 1054·4<br>11·35      | 1471·8<br>15·90       | 1014·0<br>10·92      | 2485·8<br>26·82            | } 91·7                                                                       |
| VIII. | 1873-77 { Deaths<br>Rates              | 955·8<br>9·01    | 1621·4<br>15·48 | 1365·6<br>12·85   | 1211·6<br>11·64  | 1429·4<br>13·49       | 1147·8<br>11·00      | 1487·2<br>14·02       | 1090·0<br>10·47      | 2577·2<br>24·49            |                                                                              |
| IX.   | 1878-82 { Deaths<br>Rates              | 943·8<br>7·86    | 1717·0<br>14·31 | 1383·0<br>11·52   | 1277·8<br>10·69  | 1457·6<br>12·13       | 1203·2<br>10·04      | 1489·2<br>12·40       | 1171·6<br>9·770      | 2660·8<br>22·17            | } 66·7                                                                       |
| X.    | 1883-87 { Deaths<br>Rates              | 1003·2<br>7·36   | 1704·4<br>12·52 | 1403·8<br>10·28   | 1303·8<br>9·60   | 1465·6<br>10·76       | 1242·0<br>9·12       | 1492·0<br>10·96       | 1215·6<br>8·92       | 2707·6<br>19·88            |                                                                              |
| XI.   | 1888-89<br>(2 years) { Deaths<br>Rates | 920·0<br>6·52    | 1666·5<br>10·87 | 1286·0<br>8·64    | 1300·5<br>8·75   | 1339·5<br>9·00        | 1247·0<br>8·39       | 1366·5<br>9·19        | 1220·0<br>8·20       | 2586·5<br>17·39            | } 5·1                                                                        |

\* For the actual number of annual vaccinations, see Table 51.

† With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 36.

TABLE showing, for the Borough of Leicester for each of the years 1838-89, the registered number of Deaths with the Death-rate from all causes per 1,000 Births, of Infants under three months, from three to six months, from six to twelve months, and under twelve months of age; and the registered number of Births, the Birth-rate per 1,000 living, and the per-centage of registered Vaccinations to Births.\*

| Year. | Under 3 Months. |                              | 3 to 6 Months. |                              | 6 to 12 Months. |                              | Total to 12 Months. |                              | Births. | Birth-Rate per 1,000 Population. | Per-centage of Registered Vaccinations to Total Births. |
|-------|-----------------|------------------------------|----------------|------------------------------|-----------------|------------------------------|---------------------|------------------------------|---------|----------------------------------|---------------------------------------------------------|
|       | Deaths.         | Death-Rate per 1,000 Births. | Deaths.        | Death-Rate per 1,000 Births. | Deaths.         | Death-Rate per 1,000 Births. | Deaths.             | Death-Rate per 1,000 Births. |         |                                  |                                                         |
| 1838  | 131             | 72·17                        | 63             | 34·71                        | 133             | 73·28                        | 327                 | 180·16                       | 1,815   | 38·00                            | Not known                                               |
| 1839  | 178             | 87·90                        | 80             | 39·14                        | 124             | 61·39                        | 382                 | 188·43                       | 2,024   | 41·44                            |                                                         |
| 1840  | 221             | 112·35                       | 72             | 36·60                        | 55              | 27·97                        | 348                 | 176·92                       | 1,967   | 39·37                            |                                                         |
| 1841  | 172             | 87·22                        | 57             | 28·90                        | 125             | 63·39                        | 354                 | 179·51                       | 1,972   | 38·64                            |                                                         |
| 1842  | 214             | 110·19                       | 69             | 35·53                        | 28              | 14·42                        | 311                 | 160·14                       | 1,942   | 37·39                            |                                                         |
| 1843  | 169             | 73·04                        | 59             | 39·00                        | 100             | 49·14                        | 328                 | 161·18                       | 2,035   | 38·52                            | Returns in-complete.                                    |
| 1844  | 236             | 113·07                       | 66             | 31·62                        | 39              | 18·68                        | 341                 | 163·37                       | 2,087   | 38·80                            |                                                         |
| 1845  | 236             | 107·42                       | 73             | 33·23                        | 152             | 69·18                        | 461                 | 209·83                       | 2,197   | 40·14                            |                                                         |
| 1846  | 271             | 122·46                       | 93             | 42·03                        | 133             | 60·10                        | 497                 | 224·59                       | 2,213   | 39·72                            |                                                         |
| 1847  | 202             | 100·74                       | 96             | 47·90                        | 112             | 55·84                        | 410                 | 204·48                       | 2,005   | 35·36                            |                                                         |
| 1848  | 237             | 113·33                       | 62             | 35·94                        | 141             | 70·40                        | 440                 | 219·67                       | 2,003   | 34·71                            | —                                                       |
| 1849  | 268             | 123·44                       | 84             | 38·70                        | 146             | 66·78                        | 498                 | 228·92                       | 2,171   | 36·96                            | 74·2                                                    |
| 1850  | 229             | 102·28                       | 72             | 32·15                        | 110             | 49·14                        | 411                 | 183·57                       | 2,239   | 37·45                            | 55·3                                                    |
| 1851  | 251             | 102·99                       | 84             | 34·47                        | 147             | 60·32                        | 482                 | 197·78                       | 2,437   | 40·11                            | 53·0                                                    |
| 1852  | 227             | 95·09                        | 142            | 59·49                        | 160             | 67·03                        | 529                 | 221·61                       | 2,387   | 38·83                            | 68·6                                                    |
| 1853  | 264             | 115·63                       | 84             | 36·79                        | 135             | 59·14                        | 483                 | 211·56                       | 2,283   | 36·71                            | 80·7                                                    |
| 1854  | 247             | 100·53                       | 100            | 40·70                        | 124             | 50·46                        | 471                 | 191·69                       | 2,457   | 39·06                            | 92·6                                                    |
| 1855  | 194             | 84·20                        | 105            | 45·57                        | 114             | 49·47                        | 413                 | 179·24                       | 2,301   | 36·16                            | 76·9                                                    |
| 1856  | 211             | 87·84                        | 111            | 46·71                        | 131             | 54·04                        | 453                 | 188·59                       | 2,402   | 37·32                            | 73·7                                                    |
| 1857  | 245             | 100·36                       | 113            | 46·30                        | 179             | 73·33                        | 537                 | 219·99                       | 2,441   | 37·48                            | 77·0                                                    |
| 1858  | 235             | 103·25                       | 109            | 47·89                        | 162             | 71·17                        | 506                 | 222·31                       | 2,276   | 34·54                            | 88·9                                                    |
| 1859  | 247             | 98·09                        | 108            | 42·89                        | 147             | 58·38                        | 502                 | 199·36                       | 2,518   | 37·77                            | 57·5                                                    |
| 1860  | 256             | 99·72                        | 94             | 36·58                        | 100             | 39·00                        | 450                 | 175·30                       | 2,567   | 38·05                            | 68·9                                                    |
| 1861  | 237             | 93·30                        | 113            | 44·49                        | 180             | 70·87                        | 530                 | 208·66                       | 2,540   | 37·01                            | 63·4                                                    |
| 1862  | 261             | 95·85                        | 120            | 44·07                        | 151             | 55·45                        | 532                 | 195·37                       | 2,723   | 38·37                            | 50·7                                                    |
| 1863  | 269             | 91·59                        | 159            | 54·13                        | 193             | 65·72                        | 621                 | 211·44                       | 2,937   | 40·00                            | 54·7 (140·4)†                                           |
| 1864  | 332             | 106·61                       | 143            | 45·92                        | 186             | 59·74                        | 661                 | 212·27                       | 3,114   | 41·01                            | 61·5                                                    |
| 1865  | 327             | 101·36                       | 145            | 44·95                        | 202             | 62·61                        | 674                 | 208·98                       | 3,226   | 41·09                            | 36·7                                                    |
| 1866  | 324             | 94·95                        | 189            | 55·40                        | 187             | 54·80                        | 700                 | 205·15                       | 3,412   | 42·02                            | 48·1                                                    |
| 1867  | 354             | 101·20                       | 200            | 57·17                        | 238             | 78·04                        | 792                 | 226·41                       | 3,498   | 41·66                            | 43·2                                                    |
| 1868  | 426             | 118·72                       | 219            | 61·04                        | 276             | 76·92                        | 921                 | 255·68                       | 3,588   | 41·32                            | 94·2                                                    |
| 1869  | 355             | 94·41                        | 237            | 63·03                        | 270             | 71·81                        | 862                 | 229·25                       | 3,760   | 41·87                            | 94·7                                                    |
| 1870  | 400             | 105·29                       | 219            | 57·65                        | 275             | 72·38                        | 894                 | 235·32                       | 3,799   | 40·90                            | 81·7                                                    |
| 1871  | 416             | 104·47                       | 261            | 65·55                        | 287             | 72·12                        | 964                 | 242·12                       | 3,982   | 41·55                            | 81·1                                                    |
| 1872  | 428             | 102·83                       | 296            | 71·12                        | 237             | 56·95                        | 961                 | 230·90                       | 4,162   | 42·36                            | 107·1                                                   |
| 1873  | 370             | 83·20                        | 243            | 54·64                        | 315             | 70·84                        | 928                 | 208·68                       | 4,447   | 44·14                            | 83·0                                                    |
| 1874  | 438             | 100·14                       | 197            | 45·03                        | 329             | 75·22                        | 964                 | 220·39                       | 4,374   | 42·34                            | 86·1                                                    |
| 1875  | 449             | 105·10                       | 221            | 51·81                        | 364             | 85·24                        | 1,034               | 242·15                       | 4,270   | 40·31                            | 82·6                                                    |
| 1876  | 414             | 86·59                        | 228            | 47·69                        | 314             | 65·68                        | 956                 | 199·96                       | 4,781   | 44·02                            | 71·7                                                    |
| 1877  | 389             | 81·84                        | 194            | 40·82                        | 314             | 66·06                        | 897                 | 188·72                       | 4,753   | 42·68                            | 76·9                                                    |
| 1878  | 435             | 91·02                        | 224            | 46·87                        | 322             | 67·38                        | 981                 | 205·27                       | 4,779   | 41·85                            | 70·6                                                    |
| 1879  | 396             | 84·31                        | 189            | 40·24                        | 176             | 37·47                        | 761                 | 162·02                       | 4,697   | 40·11                            | 67·0                                                    |
| 1880  | 447             | 91·79                        | 243            | 50·18                        | 380             | 78·19                        | 1,070               | 220·16                       | 4,860   | 40·04                            | 59·4                                                    |
| 1881  | 380             | 80·62                        | 216            | 45·86                        | 369             | 78·31                        | 965                 | 204·79                       | 4,712   | 38·26                            | 72·5                                                    |
| 1882  | 396             | 81·53                        | 244            | 50·25                        | 302             | 62·16                        | 942                 | 193·94                       | 4,857   | 38·46                            | 64·0                                                    |
| 1883  | 401             | 83·11                        | 215            | 44·56                        | 297             | 61·55                        | 913                 | 189·22                       | 4,825   | 37·26                            | 40·6                                                    |
| 1884  | 432             | 89·05                        | 306            | 63·00                        | 395             | 81·51                        | 1,133               | 233·56                       | 4,851   | 36·53                            | 36·3                                                    |
| 1885  | 353             | 75·38                        | 237            | 50·61                        | 317             | 67·68                        | 907                 | 193·67                       | 4,683   | 34·39                            | 39·3                                                    |
| 1886  | 401             | 82·46                        | 266            | 54·69                        | 385             | 79·17                        | 1,052               | 216·32                       | 4,863   | 34·80                            | 23·1                                                    |
| 1887  | 372             | 79·23                        | 238            | 50·69                        | 401             | 85·41                        | 1,011               | 215·33                       | 4,695   | 32·79                            | 10·0                                                    |
| 1888  | 399             | 82·88                        | 228            | 47·43                        | 353             | 73·32                        | 980                 | 203·57                       | 4,814   | 32·79                            | 6·5                                                     |
| 1889  | 407             | 83·97                        | 259            | 54·07                        | 294             | 61·37                        | 1,004               | 209·60                       | 4,790   | 31·82                            | 3·6                                                     |

\* For the actual number of annual vaccinations, see Table 51.

† The "extra vaccinations" 1863-64. (See Table 6.)—J. T. B.







This diagram shows, (1) The average annual deaths of children under three months, under six months and under one year per 1000 births, in quinquennial periods, from 1838 to 1889;

(2) The total deaths under each age, inclusive, measuring from the base line of the diagram to the upper edge of each shade of colour (the separate shades giving the deaths at each age exclusively; and

(3) That the highest death-rate of children under six months, and under one year (both exclusive and inclusive) was coincident with the period of highest infantile vaccination.

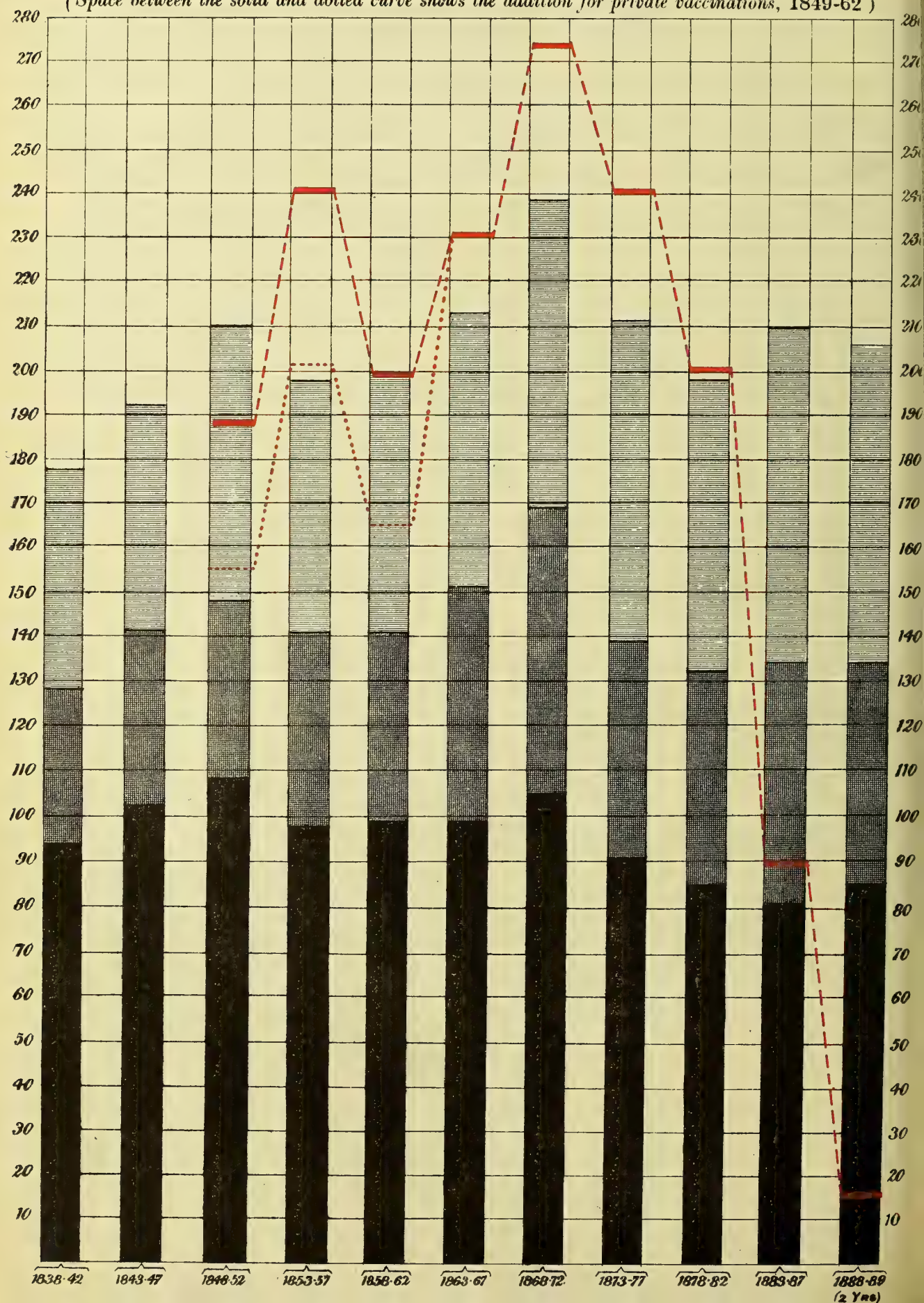
Deep black. Deaths under 3 months.

Lighter shade. .... from 3-6 .....

Lightest ....., ....., 6-12 .....

Red curve. Average annual percentage of registered vaccinations to total births (trebled to suit compass of diagram).

(Space between the solid and dotted curve shows the addition for private vaccinations, 1849-62)





(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 37.

TABLE \* showing for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the Average Annual registered number of Deaths with the Average Annual Death-rate from all causes per 1,000 Births, of Infants under three months, from three to six months, from six to twelve months, and under twelve months of age; and the Average Annual Registered Number of Births, the Average Annual Birth-rate per 1,000 living, and the Average Annual Per-centage of registered Vaccinations to Births.†

| No.   | Period.               | —                             | Deaths and Death-rate per 1,000 Births : |                |                 |                  | Number of Births and Birth rate per 1,000 Population. | Average Annual Per-centage of registered Vaccinations to total Births. |
|-------|-----------------------|-------------------------------|------------------------------------------|----------------|-----------------|------------------|-------------------------------------------------------|------------------------------------------------------------------------|
|       |                       |                               | Under 3 Months.                          | 3 to 6 Months. | 6 to 12 Months. | Under 12 Months. |                                                       |                                                                        |
| I.    | 1838-42               | Average annual number -       | 183·2                                    | 68·2           | 93·0            | 344·4            | 1944·0                                                | Not known.                                                             |
|       |                       | Average annual rate per 1,000 | 93·96                                    | 34·98          | 48·22           | 177·16           | 38·96                                                 |                                                                        |
| II.   | 1843-47               | Average annual number -       | 222·8                                    | 77·4           | 107·2           | 407·4            | 2107·4                                                | Records incomplete.                                                    |
|       |                       | Average annual rate per 1,000 | 103·34                                   | 38·76          | 51·21           | 193·31           | 38·51                                                 |                                                                        |
| III.  | 1848-52               | Average annual number -       | 242·4                                    | 88·8           | 140·8           | 472·0            | 2247·4                                                | 62·<br>(4 years).                                                      |
|       |                       | Average annual rate per 1,000 | 107·42                                   | 40·15          | 62·45           | 210·02           | 37·61                                                 |                                                                        |
| IV.   | 1853-57               | Average annual number -       | 232·2                                    | 102·6          | 136·6           | 471·4            | 2413·4                                                | 80·2                                                                   |
|       |                       | Average annual rate per 1,000 | 97·71                                    | 43·21          | 57·29           | 198·21           | 37·35                                                 |                                                                        |
| V.    | 1858-62               | Average annual number -       | 247·2                                    | 108·8          | 148·0           | 504·0            | 2524·8                                                | 65·9                                                                   |
|       |                       | Average annual rate per 1,000 | 98·04                                    | 43·18          | 58·40           | 199·62           | 37·15                                                 |                                                                        |
| VI.   | 1863-67               | Average annual number -       | 321·2                                    | 167·2          | 201·2           | 689·6            | 3237·4                                                | 74·9‡                                                                  |
|       |                       | Average annual rate per 1,000 | 99·14                                    | 51·51          | 62·36           | 213·01           | 41·15                                                 |                                                                        |
| VII.  | 1868-72               | Average annual number -       | 405·0                                    | 246·4          | 269·0           | 920·0            | 3858·2                                                | 91·7                                                                   |
|       |                       | Average annual rate per 1,000 | 105·00                                   | 63·68          | 70·03           | 238·85           | 41·60                                                 |                                                                        |
| VIII. | 1873-77               | Average annual number -       | 412·0                                    | 216·6          | 327·2           | 955·8            | 4525·0                                                | 80·0                                                                   |
|       |                       | Average annual rate per 1,000 | 91·37                                    | 48·00          | 71·86           | 211·23           | 42·69                                                 |                                                                        |
| IX.   | 1878-82               | Average annual number -       | 410·8                                    | 223·2          | 309·8           | 943·8            | 4781·0                                                | 66·7                                                                   |
|       |                       | Average annual rate per 1,000 | 85·89                                    | 46·64          | 64·88           | 197·41           | 39·74                                                 |                                                                        |
| X.    | 1883-87               | Average annual number -       | 391·8                                    | 252·4          | 359·0           | 1003·2           | 4783·0                                                | 99·9                                                                   |
|       |                       | Average annual rate per 1,000 | 81·84                                    | 52·71          | 75·17           | 209·72           | 35·15                                                 |                                                                        |
| XI.   | 1888-89<br>(2 years.) | Average annual number -       | 403·0                                    | 243·5          | 323·5           | 992·0            | 4802·0                                                | 5·1                                                                    |
|       |                       | Average annual rate per 1,000 | 83·92                                    | 50·72          | 67·35           | 206·59           | 32·30                                                 |                                                                        |

\* This table is a summary of the figures given in Table 36. See Diagram N.

† For the actual number of annual vaccinations, see Table 61.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J.T.B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 38.

TABLE showing for the Borough of Leicester for each of the Years 1838-89, the registered number of Deaths with the Death-rate from all causes per 1,000 Births, of Infants under three months, under six months, and under twelve months of Age; and the Registered Number of Births, the Birth-rate per 1,000 living, and the Per-centage of registered Vaccinations to Births.\*

| Year. | Under 3 Months.   |                              | Under 6 Months.   |                              | Under 12 Months.  |                              | Number of Births. | Birth-rate per 1,000 Population. | Per-centage of registered Vaccinations to Total Births. |
|-------|-------------------|------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|----------------------------------|---------------------------------------------------------|
|       | Number of Deaths. | Death-rate per 1,000 Births. | Number of Deaths. | Death-rate per 1,000 Births. | Number of Deaths. | Death-rate per 1,000 Births. |                   |                                  |                                                         |
| 1838  | 131               | 72·17                        | 194               | 106·88                       | 327               | 180·16                       | 1,815             | 38·00                            | } Not known.                                            |
| 1839  | 178               | 87·90                        | 258               | 127·04                       | 382               | 188·43                       | 2,024             | 41·44                            |                                                         |
| 1840  | 221               | 112·35                       | 293               | 148·95                       | 348               | 176·92                       | 1,967             | 39·37                            |                                                         |
| 1841  | 172               | 87·22                        | 229               | 116·12                       | 354               | 179·51                       | 1,972             | 38·64                            |                                                         |
| 1842  | 214               | 110·19                       | 283               | 145·72                       | 311               | 160·14                       | 1,942             | 37·39                            |                                                         |
| 1843  | 169               | 73·04                        | 228               | 112·04                       | 328               | 161·18                       | 2,035             | 38·52                            | } Returns incomplete.                                   |
| 1844  | 236               | 113·07                       | 302               | 144·69                       | 341               | 163·37                       | 2,087             | 38·80                            |                                                         |
| 1845  | 236               | 107·42                       | 309               | 140·65                       | 461               | 209·83                       | 2,197             | 40·14                            |                                                         |
| 1846  | 271               | 122·46                       | 364               | 164·49                       | 497               | 224·59                       | 2,213             | 39·72                            |                                                         |
| 1847  | 202               | 100·74                       | 298               | 148·64                       | 410               | 204·48                       | 2,005             | 35·36                            |                                                         |
| 1848  | 237               | 113·33                       | 299               | 149·27                       | 440               | 219·67                       | 2,003             | 34·71                            | } —                                                     |
| 1849  | 268               | 123·44                       | 352               | 162·14                       | 498               | 228·92                       | 2,171             | 36·96                            |                                                         |
| 1850  | 229               | 102·28                       | 301               | 134·43                       | 411               | 183·57                       | 2,239             | 37·45                            |                                                         |
| 1851  | 251               | 102·99                       | 335               | 137·46                       | 482               | 197·78                       | 2,437             | 40·11                            |                                                         |
| 1852  | 227               | 95·09                        | 369               | 154·58                       | 529               | 221·61                       | 2,387             | 38·83                            |                                                         |
| 1853  | 264               | 115·63                       | 348               | 152·42                       | 483               | 211·56                       | 2,283             | 36·71                            | 80·7                                                    |
| 1854  | 247               | 100·53                       | 347               | 141·23                       | 471               | 191·69                       | 2,457             | 39·06                            | 92·6                                                    |
| 1855  | 194               | 84·20                        | 299               | 129·77                       | 413               | 179·24                       | 2,301             | 36·16                            | 76·9                                                    |
| 1856  | 211               | 87·84                        | 322               | 134·55                       | 453               | 188·59                       | 2,402             | 37·32                            | 73·7                                                    |
| 1857  | 245               | 100·36                       | 358               | 146·66                       | 537               | 219·99                       | 2,441             | 37·48                            | 77·0                                                    |
| 1858  | 235               | 103·25                       | 344               | 151·14                       | 506               | 222·31                       | 2,276             | 34·54                            | 88·9                                                    |
| 1859  | 247               | 98·09                        | 355               | 140·98                       | 502               | 199·36                       | 2,518             | 37·77                            | 57·5                                                    |
| 1860  | 256               | 99·72                        | 350               | 136·30                       | 450               | 175·30                       | 2,567             | 38·05                            | 68·9                                                    |
| 1861  | 237               | 93·30                        | 350               | 137·79                       | 530               | 208·66                       | 2,540             | 37·01                            | 63·4                                                    |
| 1862  | 261               | 95·85                        | 381               | 139·92                       | 532               | 195·37                       | 2,723             | 38·37                            | 50·9                                                    |
| 1863  | 269               | 91·59                        | 428               | 145·72                       | 621               | 211·44                       | 2,937             | 40·00                            | 54·7(140·4†)                                            |
| 1864  | 332               | 106·61                       | 475               | 152·53                       | 661               | 212·27                       | 3,114             | 41·01                            | 61·5                                                    |
| 1865  | 327               | 101·36                       | 472               | 146·31                       | 674               | 208·92                       | 3,226             | 41·09                            | 36·7                                                    |
| 1866  | 324               | 94·95                        | 513               | 150·35                       | 700               | 205·15                       | 3,412             | 42·02                            | 48·1                                                    |
| 1867  | 354               | 101·20                       | 554               | 158·37                       | 792               | 226·41                       | 3,498             | 41·66                            | 43·2                                                    |
| 1868  | 426               | 118·72                       | 645               | 179·76                       | 921               | 256·68                       | 3,588             | 41·32                            | 94·2                                                    |
| 1869  | 355               | 94·41                        | 592               | 157·44                       | 862               | 229·25                       | 3,760             | 41·87                            | 94·7                                                    |
| 1870  | 400               | 105·29                       | 619               | 162·94                       | 894               | 235·32                       | 3,799             | 40·90                            | 81·7                                                    |
| 1871  | 416               | 104·47                       | 677               | 170·02                       | 964               | 242·12                       | 3,982             | 41·55                            | 81·1                                                    |
| 1872  | 428               | 102·83                       | 724               | 173·95                       | 961               | 230·90                       | 4,162             | 42·36                            | 107·1                                                   |
| 1873  | 370               | 83·20                        | 613               | 137·84                       | 928               | 208·68                       | 4,447             | 44·14                            | 83·0                                                    |
| 1874  | 438               | 100·14                       | 635               | 145·17                       | 964               | 220·39                       | 4,374             | 42·34                            | 86·1                                                    |
| 1875  | 449               | 105·10                       | 670               | 156·91                       | 1,034             | 242·15                       | 4,270             | 40·31                            | 82·6                                                    |
| 1876  | 414               | 86·59                        | 642               | 134·28                       | 956               | 199·96                       | 4,781             | 44·02                            | 71·7                                                    |
| 1877  | 389               | 81·84                        | 583               | 122·66                       | 897               | 188·72                       | 4,753             | 42·68                            | 76·9                                                    |
| 1878  | 435               | 91·02                        | 659               | 137·89                       | 981               | 205·27                       | 4,779             | 41·85                            | 70·6                                                    |
| 1879  | 396               | 84·31                        | 585               | 124·55                       | 761               | 162·02                       | 4,697             | 40·11                            | 67·0                                                    |
| 1880  | 447               | 91·97                        | 690               | 141·97                       | 1,070             | 220·16                       | 4,860             | 40·04                            | 59·4                                                    |
| 1881  | 380               | 80·62                        | 596               | 126·48                       | 965               | 204·79                       | 4,712             | 38·26                            | 72·5                                                    |
| 1882  | 396               | 81·53                        | 640               | 131·78                       | 942               | 193·94                       | 4,857             | 38·46                            | 64·0                                                    |
| 1883  | 401               | 83·11                        | 616               | 127·67                       | 913               | 189·22                       | 4,825             | 37·26                            | 40·6                                                    |
| 1884  | 432               | 89·05                        | 738               | 152·05                       | 1,133             | 233·56                       | 4,851             | 36·53                            | 36·3                                                    |
| 1885  | 353               | 75·38                        | 590               | 125·99                       | 907               | 193·67                       | 4,683             | 34·39                            | 39·3                                                    |
| 1886  | 401               | 82·46                        | 667               | 137·15                       | 1,052             | 216·32                       | 4,863             | 34·80                            | 23·1                                                    |
| 1887  | 372               | 79·23                        | 610               | 129·92                       | 1,011             | 215·33                       | 4,695             | 32·79                            | 10·0                                                    |
| 1888  | 399               | 82·88                        | 627               | 130·25                       | 980               | 203·57                       | 4,814             | 32·79                            | 6·5                                                     |
| 1889  | 407               | 84·97                        | 666               | 139·04                       | 1,004             | 209·60                       | 4,790             | 31·82                            | 3·6                                                     |

\* For the actual number of annual vaccinations, see Table 51.

† The "extra vaccinations," 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 39.

TABLE\* showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average annual registered number of Deaths with the average annual Death-rate from all causes per 1,000 Births, of Infants under three months, under six months, and under twelve months of age; and the average annual registered number of Births, the average annual Birth-rate per 1,000 living; and the average annual Per-centage of registered Vaccinations to Births.†

| No.   | Period.                | Under 3 Months.        |                              | Under 6 Months.        |                              | Under 12 Months.       |                              | Average Annual Births. | Birth-rate per 1,000 Population. | Average Annual Per-centage of registered Vaccinations to Total Births. |
|-------|------------------------|------------------------|------------------------------|------------------------|------------------------------|------------------------|------------------------------|------------------------|----------------------------------|------------------------------------------------------------------------|
|       |                        | Average Annual Deaths. | Death-rate per 1,000 Births. | Average Annual Deaths. | Death-rate per 1,000 Births. | Average Annual Deaths. | Death-rate per 1,000 Births. |                        |                                  |                                                                        |
| I.    | 1838-42                | 183·2                  | 93·96                        | 251·4                  | 128·94                       | 344·4                  | 177·16                       | 1944·0                 | 38·96                            | Not known.                                                             |
| II.   | 1843-47                | 222·8                  | 103·34                       | 300·2                  | 142·10                       | 407·4                  | 193·31                       | 2107·4                 | 38·51                            | Returns incomplete.                                                    |
| III.  | 1848-52                | 242·4                  | 107·42                       | 331·2                  | 147·57                       | 472·0                  | 210·02                       | 2247·4                 | 37·61                            | 62·8 (4 yrs.)                                                          |
| IV.   | 1853-57                | 232·2                  | 97·71                        | 334·8                  | 140·92                       | 471·4                  | 198·21                       | 2376·8                 | 37·35                            | 80·2                                                                   |
| V.    | 1858-62                | 247·2                  | 98·04                        | 356·0                  | 141·22                       | 504·0                  | 199·62                       | 2524·8                 | 37·15                            | 65·9                                                                   |
| VI.   | 1863-67                | 321·2                  | 99·14                        | 488·4                  | 150·65                       | 639·6                  | 213·01                       | 3237·4                 | 41·15                            | 76·9‡                                                                  |
| VII.  | 1868-72                | 405·0                  | 105·00                       | 651·4                  | 168·82                       | 920·0                  | 238·85                       | 3858·2                 | 41·60                            | 91·7                                                                   |
| VIII. | 1873-77                | 412·0                  | 91·37                        | 628·6                  | 139·37                       | 955·8                  | 211·23                       | 4525·0                 | 42·69                            | 80·0                                                                   |
| IX.   | 1878-82                | 410·8                  | 85·89                        | 634·0                  | 132·53                       | 943·8                  | 197·41                       | 4781·0                 | 39·74                            | 66·7                                                                   |
| X.    | 1883-87                | 391·8                  | 81·84                        | 644·2                  | 134·55                       | 1003·2                 | 209·72                       | 4783·0                 | 35·15                            | 29·9                                                                   |
| XI.   | 1888, 89<br>(2 years.) | 403·0                  | 83·92                        | 646·5                  | 134·64                       | 970·0                  | 206·59                       | 4802·0                 | 32·30                            | 5·1                                                                    |

\* This table is a summary of the figures given in Table 38. See Diagram N., facing page 453.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1868-64. (See Table 6.)—J.T.B.



TABLE 40.

TABLE showing, for the Borough of Leicester for each of the Years 1838-89, the approximate number of Persons living at all Ages and at certain life-periods.\*

| Year | 0-5<br>Years. | 5+<br>Years. | 5-10<br>Years. | 0-10<br>Years. | 10+<br>Years. | 10-15<br>Years. | 0-15<br>Years. | 15+<br>Years. | Total Population<br>at all Ages. |
|------|---------------|--------------|----------------|----------------|---------------|-----------------|----------------|---------------|----------------------------------|
| 1838 | 6,352         | 41,409       | 5,595          | 11,947         | 35,814        | 5,046           | 16,987         | 30,774        | 47,761                           |
| 1839 | 6,496         | 42,346       | 5,721          | 12,217         | 36,625        | 5,154           | 17,371         | 31,471        | 48,842                           |
| 1840 | 6,643         | 43,308       | 5,850          | 12,493         | 37,458        | 5,274           | 17,767         | 32,184        | 49,951                           |
| 1841 | 6,790         | 44,241       | 5,978          | 12,768         | 38,263        | 5,391           | 18,159         | 32,872        | 51,031                           |
| 1842 | 6,907         | 45,026       | 6,083          | 12,990         | 38,943        | 5,481           | 18,471         | 33,462        | 51,933                           |
| 1843 | 7,030         | 45,821       | 6,190          | 13,220         | 39,631        | 5,578           | 18,798         | 34,053        | 52,851                           |
| 1844 | 7,145         | 46,641       | 6,310          | 13,455         | 40,331        | 5,679           | 19,134         | 34,652        | 53,786                           |
| 1845 | 7,281         | 47,456       | 6,410          | 13,691         | 41,046        | 5,780           | 19,471         | 35,266        | 54,737                           |
| 1846 | 7,410         | 48,297       | 6,525          | 13,935         | 41,772        | 5,878           | 19,813         | 35,894        | 55,707                           |
| 1847 | 7,534         | 49,162       | 6,635          | 14,169         | 42,527        | 5,971           | 20,140         | 36,556        | 56,696                           |
| 1848 | 7,590         | 50,115       | 6,600          | 14,190         | 43,515        | 5,976           | 20,166         | 37,539        | 57,705                           |
| 1849 | 7,738         | 50,998       | 6,721          | 14,459         | 44,277        | 6,082           | 20,541         | 38,195        | 58,736                           |
| 1850 | 7,868         | 51,920       | 6,828          | 14,696         | 45,092        | 6,183           | 20,879         | 38,909        | 59,788                           |
| 1851 | 8,000         | 52,760       | 6,933          | 14,933         | 45,827        | 6,284           | 21,217         | 39,543        | 60,760                           |
| 1852 | 8,092         | 53,375       | 7,016          | 15,108         | 46,359        | 6,357           | 21,465         | 40,002        | 61,467                           |
| 1853 | 8,185         | 53,996       | 7,098          | 15,283         | 46,898        | 6,430           | 21,713         | 40,468        | 62,181                           |
| 1854 | 8,278         | 54,625       | 7,182          | 15,460         | 47,443        | 6,504           | 21,964         | 40,939        | 62,903                           |
| 1855 | 8,372         | 55,252       | 7,265          | 15,637         | 47,987        | 6,579           | 22,216         | 41,408        | 63,624                           |
| 1856 | 8,466         | 55,900       | 7,348          | 15,814         | 48,552        | 6,654           | 22,468         | 41,898        | 64,366                           |
| 1857 | 8,660         | 56,459       | 7,450          | 16,110         | 49,009        | 6,670           | 22,780         | 42,339        | 65,119                           |
| 1858 | 8,910         | 56,975       | 7,528          | 16,438         | 49,447        | 6,694           | 23,132         | 42,753        | 65,885                           |
| 1859 | 9,018         | 57,645       | 7,619          | 16,637         | 50,026        | 6,771           | 23,408         | 43,255        | 66,663                           |
| 1860 | 9,127         | 58,329       | 7,710          | 16,837         | 50,619        | 6,848           | 23,685         | 43,771        | 67,456                           |
| 1861 | 9,368         | 59,270       | 7,905          | 17,273         | 51,365        | 7,031           | 24,304         | 44,334        | 68,638                           |
| 1862 | 9,600         | 61,386       | 8,110          | 17,710         | 53,276        | 7,213           | 24,923         | 46,063        | 70,986                           |
| 1863 | 9,928         | 63,485       | 8,387          | 18,315         | 55,098        | 7,459           | 25,774         | 47,639        | 73,413                           |
| 1864 | 10,275        | 65,647       | 8,681          | 18,956         | 56,966        | 7,715           | 26,671         | 49,251        | 75,922                           |
| 1865 | 10,623        | 67,893       | 8,975          | 19,598         | 58,918        | 7,970           | 27,568         | 50,948        | 78,516                           |
| 1866 | 10,972        | 70,225       | 9,270          | 20,242         | 60,955        | 8,226           | 28,468         | 52,729        | 81,197                           |
| 1867 | 11,382        | 72,588       | 9,702          | 21,084         | 62,886        | 8,596           | 29,680         | 54,290        | 83,970                           |
| 1868 | 11,801        | 75,036       | 10,125         | 21,926         | 64,911        | 8,979           | 30,905         | 55,932        | 86,837                           |
| 1869 | 12,211        | 77,593       | 10,478         | 22,689         | 67,115        | 9,289           | 31,978         | 57,826        | 89,804                           |
| 1870 | 12,622        | 80,254       | 10,830         | 23,452         | 69,424        | 9,600           | 33,052         | 59,824        | 92,876                           |
| 1871 | 12,986        | 82,837       | 11,144         | 24,130         | 71,693        | 9,879           | 34,009         | 61,814        | 95,823                           |
| 1872 | 13,351        | 84,900       | 11,457         | 24,808         | 73,443        | 10,159          | 34,967         | 63,284        | 98,251                           |
| 1873 | 13,694        | 87,047       | 11,750         | 25,444         | 75,297        | 10,412          | 35,865         | 64,876        | 100,741                          |
| 1874 | 14,037        | 89,257       | 12,044         | 26,081         | 77,213        | 10,683          | 36,764         | 66,530        | 103,294                          |
| 1875 | 14,393        | 91,520       | 12,349         | 26,742         | 79,171        | 10,951          | 37,693         | 68,220        | 105,913                          |
| 1876 | 14,750        | 93,849       | 12,653         | 27,403         | 81,196        | 11,219          | 38,622         | 69,977        | 108,599                          |
| 1877 | 15,150        | 96,205       | 13,098         | 28,248         | 83,107        | 11,575          | 39,823         | 71,532        | 111,355                          |
| 1878 | 15,551        | 98,631       | 13,542         | 29,093         | 85,088        | 11,932          | 41,025         | 73,157        | 114,182                          |
| 1879 | 15,952        | 101,131      | 13,891         | 29,843         | 87,240        | 12,238          | 42,081         | 75,002        | 117,083                          |
| 1880 | 16,353        | 103,706      | 14,240         | 30,593         | 89,466        | 12,545          | 43,138         | 76,921        | 120,059                          |
| 1881 | 16,772        | 106,374      | 14,605         | 31,377         | 91,769        | 12,869          | 44,246         | 78,900        | 123,146                          |
| 1882 | 17,204        | 109,071      | 14,984         | 32,188         | 94,087        | 13,196          | 45,384         | 80,891        | 126,275                          |
| 1883 | 17,636        | 111,847      | 15,364         | 33,000         | 96,483        | 13,523          | 46,523         | 82,960        | 129,483                          |
| 1884 | 18,190        | 114,583      | 15,657         | 33,847         | 98,926        | 13,872          | 47,719         | 85,054        | 132,773                          |
| 1885 | 18,545        | 118,602      | 16,149         | 34,694         | 101,453       | 14,222          | 48,916         | 87,231        | 136,147                          |
| 1886 | 19,015        | 120,591      | 16,560         | 35,575         | 104,331       | 14,586          | 50,161         | 89,445        | 139,606                          |
| 1887 | 19,527        | 123,626      | 17,135         | 36,662         | 106,491       | 15,016          | 51,678         | 91,475        | 143,153                          |
| 1888 | 20,040        | 126,750      | 17,710         | 37,750         | 109,040       | 15,446          | 53,196         | 93,594        | 146,790                          |
| 1889 | 20,550        | 129,970      | 18,162         | 38,712         | 111,808       | 15,836          | 54,548         | 95,972        | 150,520                          |

\* The populations in this table have been calculated upon the approximate rates per 1,000 living at the several ages as given by the Registrar-General for urban districts in Volume IV., General Report, Census of England and Wales, 1881 (at pages 22 and 89).—J.T.B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 41:

TABLE showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average number of Persons living at all Ages and at certain life-periods,\* with the registered number of Deaths from all causes at each Age during each Period.

| No.   | Period.           |     | 0-5<br>Years.                      | 5-10<br>Years. | 10-15<br>Years. | 0-15<br>Years. | 15 +<br>Years. | Population<br>(all Ages) for<br>Middle Year<br>of each<br>Period, and<br>Total Deaths<br>(all Ages)<br>during each<br>Period. |         |
|-------|-------------------|-----|------------------------------------|----------------|-----------------|----------------|----------------|-------------------------------------------------------------------------------------------------------------------------------|---------|
| I.    | 1838-42           | - { | Average population<br>at each age. | 6,643          | 5,850           | 5,274          | 17,767         | 32,184                                                                                                                        | 49,951  |
|       |                   | - { | Number of deaths                   | 2,997          | 308             | 179            | 3,484          | 3,531                                                                                                                         | 7,015   |
| II.   | 1843-47           | - { | Average population<br>at each age. | 7,281          | 6,410           | 5,780          | 19,471         | 35,266                                                                                                                        | 54,737  |
|       |                   | - { | Number of deaths                   | 3,489          | 290             | 236            | 4,015          | 3,501                                                                                                                         | 7,516   |
| III.  | 1848-52           | - { | Average population<br>at each age. | 7,868          | 6,828           | 6,183          | 20,879         | 38,909                                                                                                                        | 59,788  |
|       |                   | - { | Number of deaths                   | 3,815          | 269             | 176            | 4,260          | 3,656                                                                                                                         | 7,916   |
| IV.   | 1853-57           | - { | Average population<br>at each age. | 8,372          | 7,265           | 6,579          | 22,216         | 41,408                                                                                                                        | 63,624  |
|       |                   | - { | Number of deaths                   | 3,835          | 231             | 141            | 4,207          | 3,708                                                                                                                         | 7,915   |
| V.    | 1858-62           | - { | Average population<br>at each age. | 9,127          | 7,710           | 6,848          | 23,685         | 43,771                                                                                                                        | 67,456  |
|       |                   | - { | Number of deaths                   | 4,106          | 297             | 137            | 4,540          | 3,766                                                                                                                         | 8,306   |
| VI.   | 1863-67           | - { | Average population<br>at each age. | 10,623         | 8,975           | 7,970          | 27,568         | 50,948                                                                                                                        | 78,516  |
|       |                   | - { | Number of deaths                   | 5,263          | 287             | 164            | 5,714          | 4,457                                                                                                                         | 10,171  |
| VII.  | 1868-72           | - { | Average population<br>at each age. | 12,622         | 10,830          | 9,600          | 33,052         | 59,824                                                                                                                        | 92,876  |
|       |                   | - { | Number of deaths                   | 6,772          | 385             | 202            | 7,357          | 5,070                                                                                                                         | 12,429  |
| VIII. | 1873-77           | - { | Average population<br>at each age. | 14,393         | 12,349          | 10,951         | 37,693         | 68,220                                                                                                                        | 105,913 |
|       |                   | - { | Number of deaths                   | 6,828          | 319             | 289            | 7,436          | 5,450                                                                                                                         | 12,886  |
| IX.   | 1878-82           | - { | Average population<br>at each age. | 16,353         | 14,240          | 12,545         | 43,138         | 76,921                                                                                                                        | 120,059 |
|       |                   | - { | Number of deaths                   | 6,915          | 373             | 158            | 7,446          | 5,858                                                                                                                         | 13,304  |
| X.    | 1883-87           | - { | Average population<br>at each age. | 18,545         | 16,149          | 14,222         | 48,916         | 87,231                                                                                                                        | 136,147 |
|       |                   | - { | Number of deaths                   | 7,019          | 309             | 132            | 7,460          | 6,078                                                                                                                         | 13,538  |
| XI.   | 1888-89 (2 years) | - { | Average population<br>at each age. | 20,296         | 17,934          | 15,644         | 53,874         | 94,781                                                                                                                        | 148,655 |
|       |                   | - { | Number of deaths                   | 2,572          | 107             | 54             | 2,733          | 2,440                                                                                                                         | 5,173   |

\* The populations in this table have been calculated upon the approximate rates per 1,000 living at the several ages as given by the Registrar-General for urban districts in Volume IV., General Report, Census of England and Wales, 1881 (at pages 22 and 89).—J.T.B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 42.

TABLE showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average annual registered number of Deaths from all causes at all Ages and at certain life-periods, with the average annual Death-rate per 1,000 living at each Age, and the average annual Per-centage of registered Vaccinations to Births.\*

| No.   | Period.               |                         | 0-5<br>Years. | 5-10<br>Years. | 10-15<br>Years. | 0-15<br>Years. | 15 +<br>Years. | Average<br>Annual<br>Deaths and<br>Death-rate<br>at<br>all Ages. | Average<br>Annual<br>Per-centage<br>of registered<br>Vaccinations<br>to<br>Total Births. |
|-------|-----------------------|-------------------------|---------------|----------------|-----------------|----------------|----------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| I.    | 1838-42               | Average annual deaths - | 599·4         | 61·6           | 35·8            | 696·8          | 706·2          | 1403·0                                                           | } Not known.                                                                             |
|       |                       | Death-rate per 1,000 -  | 90·23         | 10·53          | 6·08            | 39·22          | 21·94          | 28·09                                                            |                                                                                          |
| II.   | 1843-47               | Average annual deaths - | 697·8         | 58·0           | 47·2            | 803·0          | 700·2          | 1503·2                                                           | } Returns incomplete.                                                                    |
|       |                       | Death-rate per 1,000 -  | 95·84         | 9·05           | 8·17            | 41·24          | 19·89          | 27·46                                                            |                                                                                          |
| III.  | 1848-52               | Average annual deaths - | 763·0         | 53·8           | 35·2            | 852·0          | 731·2          | 1583·2                                                           | } 62·8<br>(4 years)                                                                      |
|       |                       | Death-rate per 1,000 -  | 96·85         | 7·88           | 5·69            | 40·81          | 18·79          | 26·51                                                            |                                                                                          |
| IV.   | 1853-57               | Average annual deaths - | 767·0         | 46·2           | 28·2            | 841·4          | 741·6          | 1583·0                                                           | } 80·2                                                                                   |
|       |                       | Death-rate per 1,000 -  | 91·61         | 6·36           | 4·29            | 37·89          | 17·91          | 24·88                                                            |                                                                                          |
| V.    | 1858-62               | Average annual deaths - | 821·2         | 59·4           | 27·4            | 908·0          | 753·2          | 1661·2                                                           | } 65·9                                                                                   |
|       |                       | Death-rate per 1,000 -  | 90·00         | 7·70           | 4·01            | 38·33          | 17·19          | 24·48                                                            |                                                                                          |
| VI.   | 1863-67               | Average annual deaths - | 1052·6        | 57·4           | 32·8            | 1142·8         | 891·4          | 2034·2                                                           | } 76·9†                                                                                  |
|       |                       | Death-rate per 1,000 -  | 99·09         | 6·40           | 4·11            | 41·45          | 17·49          | 25·97                                                            |                                                                                          |
| VII.  | 1868-72               | Average annual deaths - | 1354·4        | 77·0           | 40·4            | 1471·8         | 1014·0         | 2485·8                                                           | } 91·7                                                                                   |
|       |                       | Death-rate per 1,000 -  | 107·31        | 7·11           | 4·21            | 44·53          | 16·95          | 26·82                                                            |                                                                                          |
| VIII. | 1873-77               | Average annual deaths - | 1365·6        | 63·8           | 57·8            | 1487·2         | 1090·0         | 2577·2                                                           | } 80·0                                                                                   |
|       |                       | Death-rate per 1,000 -  | 94·88         | 5·17           | 5·28            | 34·96          | 15·97          | 24·49                                                            |                                                                                          |
| X.    | 1878-82               | Average annual deaths - | 1383·0        | 74·6           | 31·6            | 1489·2         | 1171·6         | 2660·8                                                           | } 66·7                                                                                   |
|       |                       | Death-rate per 1,000 -  | 84·57         | 5·24           | 2·52            | 34·52          | 15·23          | 22·17                                                            |                                                                                          |
| X.    | 1883-87               | Average annual deaths - | 1403·8        | 61·8           | 26·4            | 1492·0         | 1215·6         | 2707·6                                                           | } 29·9                                                                                   |
|       |                       | Death-rate per 1,000 -  | 75·70         | 3·82           | 1·85            | 30·50          | 13·93          | 19·88                                                            |                                                                                          |
| XI.   | 1888-89<br>(2 years.) | Average annual deaths - | 1286·0        | 53·5           | 27·0            | 1366·5         | 1220·0         | 2586·5                                                           | } 5·1                                                                                    |
|       |                       | Death-rate per 1,000 -  | 63·36         | 2·98           | 1·72            | 25·36          | 12·87          | 17·39                                                            |                                                                                          |

\* For the actual number of annual vaccinations, see Table 51.

† With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 43.

TABLE showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average number of Persons Living, at all and under and over certain Ages,\* with the registered Number of Deaths from all causes at each Age during each Period.

| No.   | Period.               |                                 | Under<br>5<br>Years. | Over<br>5<br>Years. | Under<br>10<br>Years. | Over<br>10<br>Years. | Under<br>15<br>Years. | Over<br>15<br>Years. | Population<br>(all Ages)<br>for Middle<br>Year of each<br>Period, and<br>Total Deaths<br>(all Ages)<br>during each<br>Period. |
|-------|-----------------------|---------------------------------|----------------------|---------------------|-----------------------|----------------------|-----------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------|
| I.    | 1838-42               | Average population at each age. | 6,643                | 43,308              | 12,493                | 37,458               | 17,767                | 32,184               | 49,951                                                                                                                        |
|       |                       | Total number of deaths.         | 2,997                | 4,018               | 3,305                 | 3,710                | 3,484                 | 3,531                | 7,015                                                                                                                         |
| II.   | 1843-47               | Average population at each age. | 7,281                | 47,456              | 13,691                | 41,046               | 19,471                | 35,266               | 54,737                                                                                                                        |
|       |                       | Total number of deaths.         | 3,489                | 4,027               | 3,779                 | 3,737                | 4,015                 | 3,501                | 7,516                                                                                                                         |
| III.  | 1848-52               | Average population at each age. | 7,868                | 51,920              | 14,696                | 45,092               | 20,879                | 38,909               | 59,788                                                                                                                        |
|       |                       | Total number of deaths.         | 3,815                | 4,101               | 4,084                 | 3,832                | 4,260                 | 3,656                | 7,916                                                                                                                         |
| IV.   | 1853-57               | Average population at each age. | 8,372                | 55,252              | 15,637                | 47,987               | 22,216                | 41,408               | 63,624                                                                                                                        |
|       |                       | Total number of deaths.         | 3,835                | 4,080               | 4,066                 | 3,849                | 4,207                 | 3,708                | 7,915                                                                                                                         |
| V.    | 1858-62               | Average population at each age. | 9,127                | 58,329              | 16,837                | 50,619               | 23,685                | 43,771               | 67,456                                                                                                                        |
|       |                       | Total number of deaths.         | 4,106                | 4,200               | 4,403                 | 3,903                | 4,540                 | 3,766                | 8,306                                                                                                                         |
| VI.   | 1863-67               | Average population at each age. | 10,623               | 67,893              | 19,598                | 58,918               | 27,568                | 50,948               | 78,516                                                                                                                        |
|       |                       | Total number of deaths.         | 5,263                | 4,908               | 5,550                 | 4,621                | 5,714                 | 4,457                | 10,171                                                                                                                        |
| VII.  | 1868-72               | Average population at each age. | 12,622               | 80,254              | 23,452                | 69,424               | 33,052                | 59,824               | 92,876                                                                                                                        |
|       |                       | Total number of deaths.         | 6,772                | 5,657               | 7,157                 | 5,272                | 7,357                 | 5,070                | 12,429                                                                                                                        |
| VIII. | 1873-77               | Average population at each age. | 14,393               | 91,520              | 26,742                | 79,171               | 37,693                | 68,220               | 105,913                                                                                                                       |
|       |                       | Total number of deaths.         | 6,828                | 6,058               | 7,147                 | 5,739                | 7,436                 | 5,450                | 12,886                                                                                                                        |
| IX.   | 1878-82               | Average population at each age. | 16,353               | 103,706             | 30,593                | 89,466               | 43,138                | 76,921               | 120,059                                                                                                                       |
|       |                       | Total number of deaths.         | 6,915                | 6,623               | 7,288                 | 6,250                | 7,446                 | 5,858                | 13,304                                                                                                                        |
| X.    | 1883-87               | Average population at each age. | 18,545               | 118,602             | 34,694                | 101,453              | 48,916                | 87,231               | 136,147                                                                                                                       |
|       |                       | Total number of deaths.         | 7,019                | 6,519               | 7,328                 | 6,210                | 7,460                 | 6,078                | 13,538                                                                                                                        |
| XI.   | 1888-89<br>(2 years.) | Average population at each age. | 20,296               | 128,359             | 38,230                | 110,425              | 53,874                | 94,781               | 148,655                                                                                                                       |
|       |                       | Total number of deaths.         | 2,572                | 2,601               | 2,679                 | 2,494                | 2,733                 | 2,440                | 5,173                                                                                                                         |

\* The populations in this table have been calculated upon the approximate rates per thousand living at the several ages as given by the Registrar-General for urban districts in Volume IV., General Report, Census of England and Wales, 1881 (at pages 22 and 80).—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 44.

TABLE\* showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the average annual registered number of Deaths from all causes, at all and under and over certain Ages, with the average annual Death-rate per 1,000 living at each Age, and the average annual Per-centage of registered Vaccinations to Births.†

| No.   | Period.               |                        | Under<br>5<br>Years. | Over<br>5<br>Years. | Under<br>10<br>Years. | Over<br>10<br>Years. | Under<br>15<br>Years. | Over<br>15<br>Years. | Average<br>Annual<br>Deaths and<br>Death-rate<br>at<br>all Ages. | Average<br>Annual<br>Per-centage<br>of registered<br>Vaccinations<br>to<br>Total Births. |
|-------|-----------------------|------------------------|----------------------|---------------------|-----------------------|----------------------|-----------------------|----------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| I.    | 1838-42               | Average annual deaths  | 599·4                | 803·6               | 661·0                 | 742·0                | 696·8                 | 706·2                | 1403·0                                                           | } Not known.                                                                             |
|       |                       | Death-rate per 1,000 - | 90·23                | 18·55               | 52·91                 | 19·81                | 39·22                 | 21·94                | 28·09                                                            |                                                                                          |
| II.   | 1843-47               | Average annual deaths  | 697·8                | 805·4               | 755·8                 | 747·4                | 803·0                 | 700·2                | 1503·2                                                           | } Returns<br>incomplete.                                                                 |
|       |                       | Death-rate per 1,000 - | 95·84                | 16·97               | 55·21                 | 18·21                | 41·24                 | 19·89                | 27·46                                                            |                                                                                          |
| III.  | 1848-52               | Average annual deaths  | 763·0                | 820·2               | 816·8                 | 766·4                | 852·0                 | 731·2                | 1583·2                                                           | } 62·8<br>(4 years).                                                                     |
|       |                       | Death-rate per 1,000 - | 96·85                | 15·71               | 55·58                 | 17·00                | 40·81                 | 18·79                | 26·51                                                            |                                                                                          |
| IV.   | 1853-57               | Average annual deaths  | 767·0                | 816·0               | 813·2                 | 769·8                | 841·4                 | 741·6                | 1583·0                                                           | } 80·2                                                                                   |
|       |                       | Death-rate per 1,000 - | 91·61                | 14·77               | 52·00                 | 16·04                | 37·89                 | 17·91                | 24·88                                                            |                                                                                          |
| V.    | 1858-62               | Average annual deaths  | 821·2                | 840·0               | 880·6                 | 780·6                | 908·0                 | 753·2                | 1661·2                                                           | } 65·9                                                                                   |
|       |                       | Death-rate per 1,000 - | 90·00                | 14·40               | 52·29                 | 15·40                | 38·33                 | 17·10                | 24·48                                                            |                                                                                          |
| VI.   | 1863-67               | Average annual deaths  | 1052·6               | 981·6               | 1110·0                | 924·2                | 1142·8                | 891·4                | 2034·2                                                           | } 76·9†                                                                                  |
|       |                       | Death-rate per 1,000 - | 99·09                | 14·45               | 56·51                 | 15·68                | 41·45                 | 17·49                | 25·97                                                            |                                                                                          |
| VII.  | 1868-72               | Average annual deaths  | 1354·4               | 1131·4              | 1431·4                | 1054·4               | 1471·8                | 1014·0               | 2485·8                                                           | } 91·7                                                                                   |
|       |                       | Death-rate per 1,000 - | 107·31               | 14·09               | 61·02                 | 15·18                | 44·53                 | 16·95                | 26·82                                                            |                                                                                          |
| VIII. | 1873-77               | Average annual deaths  | 1365·6               | 1211·6              | 1429·4                | 1147·8               | 1487·2                | 1090·0               | 2577·2                                                           | } 80·0                                                                                   |
|       |                       | Death-rate per 1,000 - | 94·88                | 13·23               | 53·45                 | 14·50                | 39·46                 | 15·97                | 24·49                                                            |                                                                                          |
| IX.   | 1878-82               | Average annual deaths  | 1383·0               | 1277·8              | 1457·6                | 1203·2               | 1489·2                | 1171·6               | 2660·8                                                           | } 66·7                                                                                   |
|       |                       | Death-rate per 1,000 - | 84·57                | 12·32               | 47·64                 | 13·44                | 34·52                 | 15·23                | 22·17                                                            |                                                                                          |
| X.    | 1883-87               | Average annual deaths  | 1403·8               | 1303·8              | 1465·6                | 1242·0               | 1492·0                | 1215·6               | 2707·6                                                           | } 29·9                                                                                   |
|       |                       | Death-rate per 1,000 - | 75·70                | 11·00               | 42·24                 | 12·24                | 30·50                 | 13·93                | 19·88                                                            |                                                                                          |
| XI.   | 1888-89<br>(2 years.) | Average annual deaths  | 1286·0               | 1300·5              | 1339·5                | 1247·0               | 1366·5                | 1220·0               | 2586·5                                                           | } 5·1                                                                                    |
|       |                       | Death-rate per 1,000 - | 63·36                | 10·13               | 35·04                 | 11·29                | 25·36                 | 12·87                | 17·39                                                            |                                                                                          |

\* See Diagram O.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.











(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 45.

TABLE\* showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the total number of Small-pox Deaths at all Ages and at certain life-periods, the average annual Small-pox Death-rate per million living at each Age, and the relative Per-centage of such Death-rates, with the average annual Per-centage of registered Vaccinations to Births.†

| No.   | Period.               |                                                                                                                                                                                | 0-5<br>Years. | 5-10<br>Years. | 10-15<br>Years. | 15 +<br>Years. | All Ages. | Average<br>Annual<br>Per-centage<br>of Vaccina-<br>tions to<br>Total Births. |
|-------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|-----------------|----------------|-----------|------------------------------------------------------------------------------|
| I.    | 1838-42               | Total small-pox deaths during period. 122<br>Average annual small-pox death-rate per million living at each age. 3,673<br>Relative per-centage of the per million rates. 85.14 |               |                |                 |                |           | No Returns.                                                                  |
| II.   | 1843-47               | Total small-pox deaths - 141<br>Average annual death-rate per million. 3,869<br>Relative per-centage - 76.97                                                                   |               |                |                 |                |           | Returns incomplete.                                                          |
| III.  | 1848-52               | Total small-pox deaths - 125<br>Average annual death-rate per million. 3,175<br>Relative per-centage - 81.94                                                                   |               |                |                 |                |           | 62.8<br>(4 years).                                                           |
| IV.   | 1853-57               | Total small-pox deaths - 19<br>Average annual death-rate per million. 454<br>Relative per-centage - 79.23                                                                      |               |                |                 |                |           | 80.2                                                                         |
| V.    | 1858-62               | Total small-pox deaths - 37<br>Average annual death-rate per million. 811<br>Relative per-centage - 74.68                                                                      |               |                |                 |                |           | 65.9                                                                         |
| VI.   | 1863-67               | Total small-pox deaths - 78<br>Average annual death-rate per million. 1,468<br>Relative per-centage - 71.16                                                                    |               |                |                 |                |           | 76.9‡                                                                        |
| VII.  | 1868-72               | Total small-pox deaths - 118<br>Average annual death-rate per million. 1,870<br>Relative per-centage - 46.50                                                                   |               |                |                 |                |           | 91.7                                                                         |
| VIII. | 1873-77               | Total small-pox deaths - 4<br>Average annual death-rate per million. 56<br>Relative per-centage - 66.66                                                                        |               |                |                 |                |           | 80.0                                                                         |
| IX.   | 1878-82               | Total small-pox deaths - 2<br>Average annual death-rate per million. 24<br>Relative per-centage - 36.37                                                                        |               |                |                 |                |           | 66.7                                                                         |
| X.    | 1883-87               | Total small-pox deaths - 1<br>Average annual death-rate per million. 11<br>Relative per-centage - 44.0                                                                         |               |                |                 |                |           | 29.9                                                                         |
| XI.   | 1888-89<br>(2 years.) | Total small-pox deaths - 0<br>Average annual death-rate per million. 0<br>Relative per-centage - 0.0                                                                           |               |                |                 |                |           | 5.1                                                                          |

\* This table is based on the figures given in Table 40 for the population at the several ages.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J. T. B.



(Papers handed in by Mr. John Thomas Biggs.)

TABLE 46.

TABLE\* showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the total number of Small-pox Deaths, at all and under and over certain Ages, the average annual Small-pox Death-rate per million living at each Age, and the relative Per-centage of such Death-rates, with the average annual Per-centage of Registered Vaccinations to Births.†

| No.   | Period.              | —                                                                                                                                                              | Under<br>5<br>Years. | Over<br>5<br>Years. | Under<br>10<br>Years. | Over<br>10<br>Years. | Under<br>15<br>Years. | Over<br>15<br>Years. | All Ages.  | Average<br>Annual<br>Per-centage<br>of Registered<br>Vaccina-<br>tions to<br>Total Births. |
|-------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|-----------------------|----------------------|-----------------------|----------------------|------------|--------------------------------------------------------------------------------------------|
| I.    | 1838-42              | Total small-pox deaths during period.<br>Average annual small-pox death-rate per million living at each age.<br>Relative per-centage of the per million rates. | 122<br>3,673<br>96·8 | 26<br>120<br>3·2    | 138<br>2,208<br>97·7  | 10<br>53<br>2·3      | 139<br>1,564<br>96·6  | 9<br>56<br>3·4       | 148<br>592 | No Re-<br>turns.                                                                           |
| II.   | 1843-47              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 141<br>3,869<br>96·4 | 45<br>148<br>3·6    | 173<br>2,526<br>98·3  | 13<br>43<br>1·7      | 176<br>1,808<br>97·0  | 10<br>57<br>3·0      | 186<br>679 | Returns in-<br>complete.                                                                   |
| III.  | 1848-52              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 125<br>3,175<br>96·3 | 31<br>120<br>3·7    | 144<br>1,960<br>97·4  | 12<br>53<br>2·6      | 147<br>1,408<br>96·9  | 9<br>46<br>3·1       | 156<br>522 | 62·8<br>(4 years).                                                                         |
| IV.   | 1853-57              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 19<br>454<br>92·7    | 10<br>36<br>7·3     | 21<br>268<br>81·0     | 8<br>33<br>19·0      | 22<br>198<br>85·4     | 7<br>34<br>14·6      | 29<br>91   | 80·2                                                                                       |
| V.    | 1858-62              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 37<br>811<br>91·6    | 22<br>75<br>8·4     | 44<br>522<br>89·8     | 15<br>59<br>10·2     | 45<br>380<br>85·6     | 14<br>64<br>14·4     | 59<br>175  | 65·9                                                                                       |
| VI.   | 1863-67              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 78<br>1,468<br>91·5  | 46<br>135<br>8·4    | 96<br>469<br>83·2     | 28<br>95<br>16·8     | 100<br>725<br>88·5    | 24<br>94<br>11·5     | 124<br>316 | 76·9‡                                                                                      |
| VII.  | 1868-72              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 118<br>1,870<br>75·7 | 241<br>600<br>24·3  | 193<br>1,646<br>77·5  | 166<br>478<br>22·5   | 205<br>1,241<br>70·7  | 154<br>515<br>29·3   | 359<br>773 | 91·7                                                                                       |
| VIII. | 1873-77              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 4<br>56<br>83·6      | 5<br>11<br>16·4     | 5<br>37<br>78·8       | 4<br>10<br>21·2      | 5<br>27<br>69·2       | 4<br>12<br>30·8      | 9<br>17    | 80·0                                                                                       |
| IX.   | 1878-82              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 2<br>24<br>68·6      | 6<br>11<br>31·4     | 2<br>13<br>50·0       | 6<br>13<br>50·0      | 4<br>19<br>65·5       | 4<br>10<br>34·5      | 8<br>13    | 66·7                                                                                       |
| X.    | 1883-87              | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 1<br>11<br>78·5      | 2<br>3<br>21·5      | 2<br>12<br>85·7       | 1<br>2<br>14·3       | 2<br>8<br>80·0        | 1<br>2<br>20·0       | 3<br>4     | 29·9                                                                                       |
| XI.   | 1888-89<br>(2 years) | Total small-pox deaths<br>Average annual death-rate per million.<br>Relative per-centage -                                                                     | 0<br>0<br>0·0        | 0<br>0<br>0·0       | 0<br>0<br>0·0         | 0<br>0<br>0·0        | 0<br>0<br>0·0         | 0<br>0<br>0·0        | 0<br>0     | 5·1                                                                                        |

\* This table is based on the figures given in Table 40 for the population at the several ages.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J.T.B.



(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 47.

TABLE\* showing, for the Borough of Leicester during the Years 1849-89, in Quinquennial Periods, the total number of Deaths from Small-pox and from Fevers, of Children under 5 and under 15 Years of Age and of Persons at all Ages, and the Proportion of such Deaths under 5 and under 15 Years per cent. of the deaths from these diseases at all Ages, with the average annual per-centage of Registered Vaccinations to Births.†

| No.   | Period.           | Small-pox.                |                           | Fevers (Typhus, Typhoid, and Simple Fevers). |                           | Average Annual Per-centage of Registered Vaccinations to Total Births. |
|-------|-------------------|---------------------------|---------------------------|----------------------------------------------|---------------------------|------------------------------------------------------------------------|
|       |                   | Under 5 years.            | Under 15 years.           | Under 5 years.                               | Under 15 years.           |                                                                        |
| I.    | 1849-52 (4 years) | $\frac{98}{125} = 78.40$  | $\frac{116}{125} = 92.80$ | $\frac{85}{322} = 26.40$                     | $\frac{159}{322} = 49.38$ | 62.8                                                                   |
| II.   | 1853-57 -         | $\frac{19}{29} = 65.52$   | $\frac{22}{29} = 75.86$   | $\frac{135}{403} = 33.50$                    | $\frac{218}{403} = 54.10$ | 80.2                                                                   |
| III.  | 1858-62 -         | $\frac{37}{59} = 62.71$   | $\frac{45}{59} = 76.27$   | $\frac{84}{251} = 33.46$                     | $\frac{150}{251} = 59.76$ | 65.9                                                                   |
| IV.   | 1863-67 -         | $\frac{78}{124} = 62.90$  | $\frac{100}{124} = 80.64$ | $\frac{40}{239} = 16.73$                     | $\frac{98}{239} = 41.00$  | 76.9‡                                                                  |
| V.    | 1868-72 -         | $\frac{118}{359} = 32.87$ | $\frac{205}{359} = 57.10$ | $\frac{62}{292} = 21.23$                     | $\frac{144}{292} = 49.31$ | 91.7                                                                   |
| VI.   | 1873-77 -         | $\frac{4}{9} = 44.44$     | $\frac{5}{9} = 55.55$     | $\frac{40}{230} = 17.39$                     | $\frac{93}{230} = 40.43$  | 80.0                                                                   |
| VII.  | 1878-82 -         | $\frac{2}{8} = 25.00$     | $\frac{4}{8} = 50.00$     | $\frac{30}{146} = 20.55$                     | $\frac{72}{146} = 49.31$  | 66.7                                                                   |
| VIII. | 1883-87 -         | $\frac{1}{3} = 33.33$     | $\frac{2}{3} = 66.66$     | $\frac{12}{112} = 10.71$                     | $\frac{46}{112} = 41.07$  | 29.9                                                                   |
| IX.   | 1888-89 (2 years) | $\frac{0}{0} = 0.00$      | $\frac{0}{0} = 0.00$      | $\frac{4}{54} = 7.41$                        | $\frac{22}{54} = 40.74$   | 5.1                                                                    |

\* In this table the numerators of the fractions give the number of deaths from the specified diseases at the ages under 5 and under 15 years, and the denominators the deaths from those diseases at all ages.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J.T.B.

TABLE 48.

TABLE\* showing, for the Borough of Leicester during the Years 1849-89, in Quinquennial Periods, the total number of Deaths from Small-pox and from all causes of Children under 5 and under 15 Years of Age, and the proportion of the Deaths at those Ages from Small-pox per cent. of the Deaths at the same Ages from all causes, with the average annual per-centage of Registered Vaccinations to Births.†

| No.   | Period.           | Under 5 years.            | Under 15 years.           | Average Annual Per-centage of Registered Vaccinations to Total Births. |
|-------|-------------------|---------------------------|---------------------------|------------------------------------------------------------------------|
| I.    | 1849-52 (4 years) | $\frac{98}{3097} = 3.16$  | $\frac{116}{3455} = 3.36$ | 62.8                                                                   |
| II.   | 1853-57 -         | $\frac{19}{3835} = 0.50$  | $\frac{22}{4207} = 0.52$  | 80.2                                                                   |
| III.  | 1858-62 -         | $\frac{37}{4106} = 0.90$  | $\frac{45}{4540} = 0.99$  | 65.9                                                                   |
| IV.   | 1863-67 -         | $\frac{78}{5263} = 1.48$  | $\frac{100}{5714} = 1.75$ | 76.9‡                                                                  |
| V.    | 1868-72 -         | $\frac{118}{6772} = 1.74$ | $\frac{205}{7357} = 2.78$ | 91.7                                                                   |
| VI.   | 1873-77 -         | $\frac{4}{6828} = 0.06$   | $\frac{5}{7436} = 0.07$   | 80.0                                                                   |
| VII.  | 1878-82 -         | $\frac{2}{6915} = 0.03$   | $\frac{4}{7446} = 0.05$   | 66.7                                                                   |
| VIII. | 1883-87 -         | $\frac{1}{7019} = 0.01$   | $\frac{2}{7460} = 0.03$   | 29.9                                                                   |
| IX.   | 1888-89 (2 years) | $\frac{0}{2572} = 0.00$   | $\frac{0}{2733} = 0.00$   | 5.1                                                                    |

\* In this table the numerators of the fractions give the number of deaths from Small-pox at the ages under 5 and under 15 years, and the denominators the deaths from all causes at those ages.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J.T.B.



TABLE 49.

TABLE\* showing, for the Borough of Leicester during the Years 1838-89, in Quinquennial Periods, the total number of Deaths at all Ages from Small-pox, from Fevers, from the Seven Principal Zymotic Diseases, and from all causes, and the Proportion of the Deaths from Small-pox, from Fevers, and from the Seven Principal Zymotic Diseases per cent. of the Deaths from all causes, with the average annual per-centage of Registered Vaccinations to Births.†

| No.   | Period.             | Per-centage of Deaths from Small-pox. | Per-centage of Deaths from Fevers. (Typhus, Typhoid, and Simple Fever.) | Per-centage of Deaths from the Seven Zymotics. | Average Annual Per-centage of Registered Vaccinations to Total Births. |
|-------|---------------------|---------------------------------------|-------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------|
| I.    | 1838-42 - -         | $\frac{148}{7015} = 2.11$             | $\frac{382}{7015} = 5.44$                                               | $\frac{1593}{7015} = 22.70$                    | Not known.                                                             |
| II.   | 1843-47 - -         | $\frac{186}{7516} = 2.47$             | $\frac{345}{7516} = 4.59$                                               | $\frac{1693}{7516} = 22.52$                    | Returns incomplete.                                                    |
| III.  | 1848-52 - -         | $\frac{156}{7916} = 1.97$             | $\frac{404}{7916} = 5.10$                                               | $\frac{1851}{7916} = 23.38$                    | 62.8 (4 years.)                                                        |
| IV.   | 1853-57 - -         | $\frac{29}{7915} = 0.36$              | $\frac{403}{7915} = 5.09$                                               | $\frac{1675}{7915} = 21.16$                    | 80.2                                                                   |
| V.    | 1858-62 - -         | $\frac{59}{8306} = 0.71$              | $\frac{251}{8306} = 3.02$                                               | $\frac{1557}{8306} = 18.74$                    | 65.9                                                                   |
| VI.   | 1863-67 - -         | $\frac{124}{10171} = 1.22$            | $\frac{239}{10171} = 2.35$                                              | $\frac{2045}{10171} = 20.10$                   | 76.9‡                                                                  |
| VII.  | 1868-72 - -         | $\frac{359}{12429} = 2.88$            | $\frac{292}{12429} = 2.35$                                              | $\frac{3182}{12429} = 25.60$                   | 91.7                                                                   |
| VIII. | 1873-77 - -         | $\frac{9}{12886} = 0.07$              | $\frac{230}{12886} = 1.78$                                              | $\frac{2532}{12886} = 19.65$                   | 80.0                                                                   |
| IX.   | 1878-82 - -         | $\frac{8}{13304} = 0.06$              | $\frac{146}{13304} = 1.09$                                              | $\frac{2571}{13304} = 19.32$                   | 66.7                                                                   |
| X.    | 1883-87 - -         | $\frac{3}{13538} = 0.02$              | $\frac{112}{13538} = 0.83$                                              | $\frac{2173}{13538} = 16.05$                   | 29.9                                                                   |
| XI.   | 1888-89 (2 years) - | $\frac{0}{5173} = 0.00$               | $\frac{54}{5173} = 1.04$                                                | $\frac{707}{5173} = 13.67$                     | 5.1                                                                    |

\* In this table the numerators of the fractions give the number of deaths from the specified diseases at all ages, and the denominators the deaths from all causes at all ages. See Diagram P.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J.T.B.

TABLE 50.

TABLE\* showing, for the Borough of Leicester during the Years 1838-1889, in Quinquennial Periods, the total number of Deaths from all causes of Children under 5 and under 15 Years of Age and of Persons at all Ages, and the proportion of such Deaths under 5 and under 15 Years per cent. of those at all Ages, with the average annual per-centage of Registered Vaccinations to Births.†

| No.   | Period.             | Under 5 Years.               | Under 15 Years.              | Average Annual Per-centage of Registered Vaccinations to Total Births. |
|-------|---------------------|------------------------------|------------------------------|------------------------------------------------------------------------|
| I.    | 1838-42 - -         | $\frac{2997}{7015} = 42.72$  | $\frac{3484}{7015} = 49.66$  | Not known.                                                             |
| II.   | 1843-47 - -         | $\frac{3489}{7516} = 46.42$  | $\frac{4015}{7516} = 53.42$  | Returns incomplete.                                                    |
| III.  | 1848-52 - -         | $\frac{3815}{7916} = 48.19$  | $\frac{4260}{7916} = 53.81$  | 62.8 (4 years.)                                                        |
| IV.   | 1853-57 - -         | $\frac{3835}{7915} = 48.45$  | $\frac{4207}{7915} = 53.15$  | 80.2                                                                   |
| V.    | 1858-62 - -         | $\frac{4106}{8306} = 49.43$  | $\frac{4540}{8306} = 54.66$  | 65.9                                                                   |
| VI.   | 1863-67 - -         | $\frac{5263}{10171} = 51.74$ | $\frac{5714}{10171} = 56.18$ | 76.9‡                                                                  |
| VII.  | 1868-72 - -         | $\frac{6772}{12429} = 54.48$ | $\frac{7357}{12429} = 59.19$ | 91.7                                                                   |
| VIII. | 1873-77 - -         | $\frac{6828}{12886} = 52.98$ | $\frac{7436}{12886} = 57.70$ | 80.0                                                                   |
| IX.   | 1878-82 - -         | $\frac{6915}{13304} = 51.97$ | $\frac{7446}{13304} = 55.96$ | 66.7                                                                   |
| X.    | 1883-87 - -         | $\frac{7019}{13538} = 51.83$ | $\frac{7460}{13538} = 55.10$ | 29.9                                                                   |
| XI.   | 1888-89 (2 years) - | $\frac{2572}{5173} = 49.72$  | $\frac{2733}{5173} = 52.83$  | 5.1                                                                    |

\* In this table the numerators of the fractions give the number of deaths from all causes at the ages under 5 and under 15 years, and the denominators the deaths from all causes at all ages.

† For the actual number of annual vaccinations, see Table 51.

‡ With the "extra vaccinations" for 1863-64. (See Table 6.)—J.T.B.



(Papers handed in by Mr. John Thomas Biggs.)

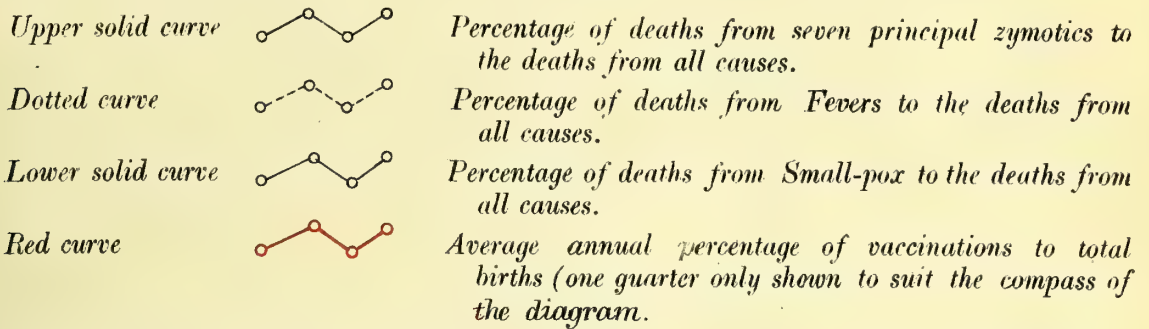
DIAGRAM P. illustrating Table 49.

This diagram shows, (1) The proportion of deaths from Small-pox, Fevers (Typhus, Typhoid and Simple Fevers), and the seven principal zymotic causes out of every 100 deaths from all causes;

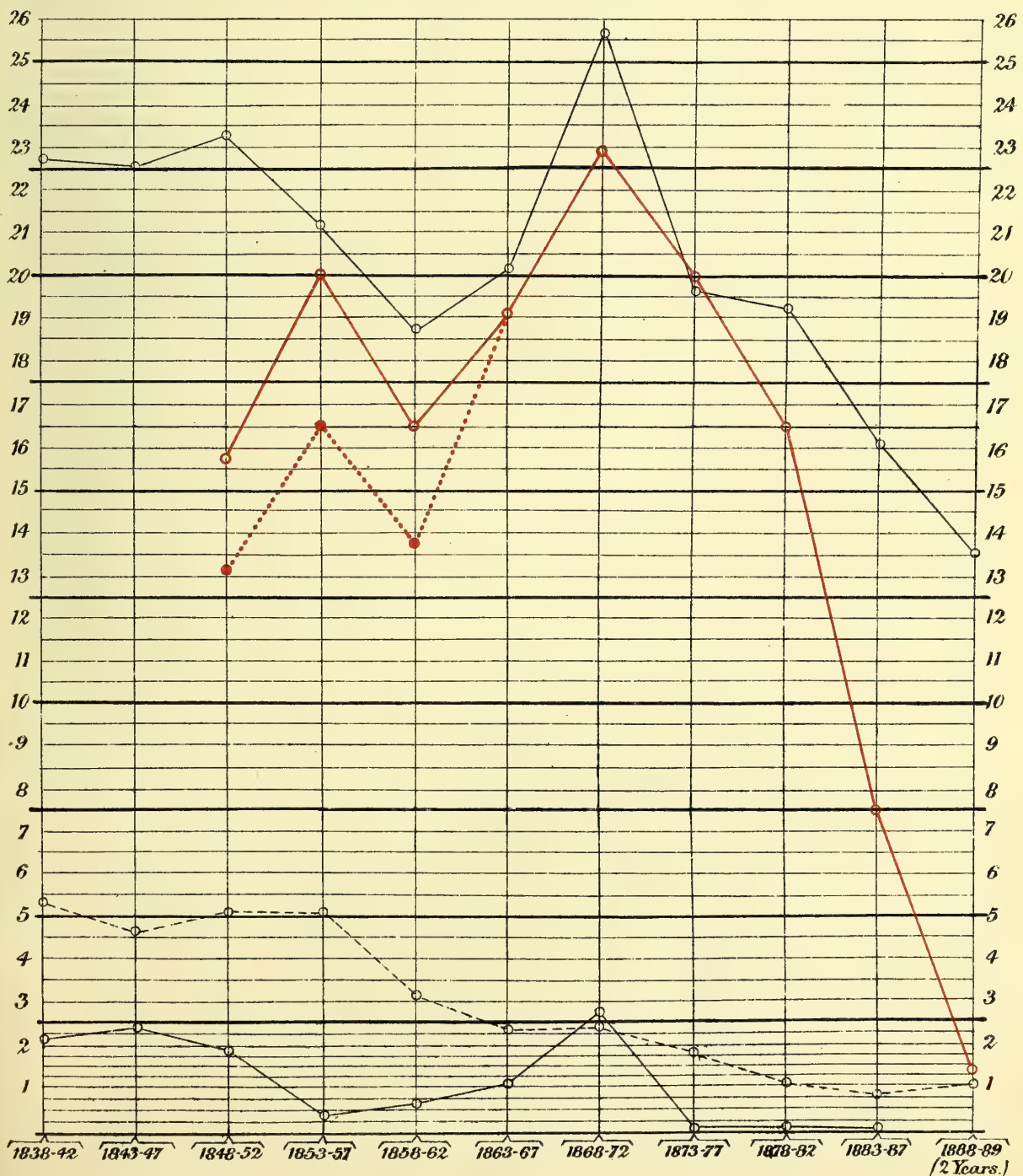
(2) A great rise in the percentage share of Small-pox and zymotic mortality was concurrent with a similar rise of the percentage of vaccinations;

(3) That the highest mortality from Small-pox, and the greatest mortality from the seven principal zymotics, corresponds with the highest period of vaccination 1868-72; and

(4) An enormous fall in the percentage share of the seven principal zymotics, a low average mortality from Fevers, and the entire disappearance of Small-pox, coincides with the rapid decline and almost entire rejection of vaccination.



(The space between solid and dotted red curves shows the addition for private vaccinations, 1849-62.)









(Papers handed in by Mr. John Thomas Biggs.)

App. No. 3.

TABLE 51.

TABLE showing, for the Borough of Leicester for each of the Years 1849-89, the Total Number of Registered Vaccinations,\* the Per-centage of such Vaccinations to the Births registered in each of the same Years, and the rate to 5,000 Births, and to 100,000 Population respectively, with an Estimate of the Number of Public and Private Vaccinations performed in each Year.†

| Year.  | Public Vaccinations.                                        |                                                                                         |                                                                                                                  |                                                            | Private Vaccinations.<br>Estimated Number performed in each Year ending the 31st of December. | Total Vaccinations, (Public and Private.) (In each Year ending the 31st of December). |                                                         |                                                  |                                                        |
|--------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------|
|        | Number performed in each Year ending the 29th of September. | To estimate the Number performed in each Year ending the 31st of December :             |                                                                                                                  | Number performed in each Year ending the 31st of December. |                                                                                               | Total number of registered Vaccinations.                                              | Per-centage of registered Vaccinations to total Births. | Rate of registered Vaccinations to 5,000 Births. | Rate of registered Vaccinations to 100,000 Population. |
|        |                                                             | Deduct One Quarter from the Number performed in each Year ending the 29th of September: | And add to the Remainder One Quarter of the Number performed in the following Year ending the 29th of September. |                                                            |                                                                                               |                                                                                       |                                                         |                                                  |                                                        |
| 1849   | 1,441                                                       | -360                                                                                    | +263                                                                                                             | 1,344                                                      | 269                                                                                           | 1,613                                                                                 | 74.2                                                    | 3,710                                            | 2,736                                                  |
| 1850   | 1,051                                                       | -263                                                                                    | +245                                                                                                             | 1,033                                                      | 207                                                                                           | 1,240                                                                                 | 55.3                                                    | 2,765                                            | 2,070                                                  |
| 1851   | 982                                                         | -245                                                                                    | +340                                                                                                             | 1,677                                                      | 215                                                                                           | 1,292                                                                                 | 53.0                                                    | 2,650                                            | 2,119                                                  |
| 1852   | 1,362                                                       | -340                                                                                    | +342                                                                                                             | 1,364                                                      | 273                                                                                           | 1,637                                                                                 | 68.6                                                    | 3,430                                            | 2,668                                                  |
| 1853   | 1,369                                                       | -342                                                                                    | +509                                                                                                             | 1,536                                                      | 307                                                                                           | 1,843                                                                                 | 80.7                                                    | 4,036                                            | 2,964                                                  |
| 1854   | 2,037                                                       | -509                                                                                    | +368                                                                                                             | 1,896                                                      | 379                                                                                           | 2,275                                                                                 | 92.6                                                    | 4,630                                            | 3,613                                                  |
| 1855   | 1,474                                                       | -368                                                                                    | +370                                                                                                             | 1,476                                                      | 295                                                                                           | 1,771                                                                                 | 76.9                                                    | 3,843                                            | 2,824                                                  |
| 1856   | 1,480                                                       | -370                                                                                    | +366                                                                                                             | 1,476                                                      | 295                                                                                           | 1,771                                                                                 | 73.7                                                    | 3,686                                            | 2,749                                                  |
| 1857   | 1,463                                                       | -366                                                                                    | +470                                                                                                             | 1,567                                                      | 313                                                                                           | 1,880                                                                                 | 77.0                                                    | 3,851                                            | 2,888                                                  |
| 1858   | 1,880                                                       | -470                                                                                    | +278                                                                                                             | 1,688                                                      | 338                                                                                           | 2,026                                                                                 | 88.9                                                    | 4,447                                            | 3,073                                                  |
| 1859   | 1,111                                                       | -278                                                                                    | +373                                                                                                             | 1,206                                                      | 241                                                                                           | 1,447                                                                                 | 57.5                                                    | 2,873                                            | 2,170                                                  |
| 1860   | 1,491                                                       | -373                                                                                    | +354                                                                                                             | 1,472                                                      | 294                                                                                           | 1,766                                                                                 | 68.9                                                    | 3,444                                            | 2,621                                                  |
| 1861   | 1,415                                                       | -354                                                                                    | +284                                                                                                             | 1,345                                                      | 269                                                                                           | 1,614                                                                                 | 63.4                                                    | 3,172                                            | 2,350                                                  |
| 1862   | 1,136                                                       | -284                                                                                    | +305                                                                                                             | 1,157                                                      | 231                                                                                           | 1,388                                                                                 | 50.9                                                    | 2,547                                            | 1,955                                                  |
| 1863   | 1,221 (4,320†)                                              | -305                                                                                    | +383                                                                                                             | 1,299                                                      | 309                                                                                           | 1,608                                                                                 | 54.7 (140.4†)                                           | 2,734 (7,020†)                                   | 2,187 (5,789†)                                         |
| 1864   | 1,533                                                       | -383                                                                                    | +234                                                                                                             | 1,384                                                      | 532                                                                                           | 1,916                                                                                 | 61.5                                                    | 3,075                                            | 2,529                                                  |
| 1865   | 938                                                         | -234                                                                                    | +265                                                                                                             | 969                                                        | 214                                                                                           | 1,183                                                                                 | 36.7                                                    | 1,834                                            | 1,514                                                  |
| 1866   | 1,060                                                       | -265                                                                                    | +361                                                                                                             | 1,156                                                      | 485                                                                                           | 1,641                                                                                 | 48.1                                                    | 2,405                                            | 2,018                                                  |
| 1867   | 1,445                                                       | -361                                                                                    | +348                                                                                                             | 1,432                                                      | 112                                                                                           | 1,544                                                                                 | 43.2                                                    | 2,158                                            | 1,837                                                  |
| 1868   | 1,391                                                       | -348                                                                                    | +688                                                                                                             | 1,731                                                      | 1,648                                                                                         | 3,379                                                                                 | 94.2                                                    | 4,709                                            | 3,886                                                  |
| 1869   | 2,752                                                       | -688                                                                                    | +493                                                                                                             | 2,557                                                      | 1,003                                                                                         | 3,560                                                                                 | 94.7                                                    | 4,734                                            | 3,952                                                  |
| 1870   | 1,973                                                       | -493                                                                                    | +496                                                                                                             | 1,976                                                      | 1,127                                                                                         | 3,103                                                                                 | 81.7                                                    | 4,084                                            | 3,351                                                  |
| 1871   | 1,983                                                       | -496                                                                                    | +653                                                                                                             | 2,140                                                      | 1,090                                                                                         | 3,230                                                                                 | 81.1                                                    | 4,056                                            | 3,359                                                  |
| 1872   | 2,611                                                       | -653                                                                                    | +508                                                                                                             | 2,466                                                      | 1,990                                                                                         | 4,456                                                                                 | 107.1                                                   | 5,353                                            | 4,545                                                  |
| 1873   | 2,033                                                       | -508                                                                                    | +620                                                                                                             | 2,145                                                      | 1,547                                                                                         | 3,692                                                                                 | 83.0                                                    | 4,151                                            | 3,655                                                  |
| 1874   | 2,482                                                       | -620                                                                                    | +515                                                                                                             | 2,377                                                      | 1,387                                                                                         | 3,764                                                                                 | 86.1                                                    | 4,303                                            | 3,651                                                  |
| 1875   | 2,060                                                       | -515                                                                                    | +527                                                                                                             | 2,072                                                      | 1,455                                                                                         | 3,527                                                                                 | 82.6                                                    | 4,130                                            | 3,330                                                  |
| 1876   | 2,106                                                       | -527                                                                                    | +501                                                                                                             | 2,080                                                      | 1,346                                                                                         | 3,426                                                                                 | 71.7                                                    | 3,583                                            | 3,118                                                  |
| 1877   | 2,006                                                       | -501                                                                                    | +505                                                                                                             | 2,010                                                      | 1,643                                                                                         | 3,653                                                                                 | 76.9                                                    | 3,843                                            | 3,251                                                  |
| 1878   | 2,023                                                       | -505                                                                                    | +486                                                                                                             | 2,004                                                      | 1,368                                                                                         | 3,372                                                                                 | 70.6                                                    | 3,528                                            | 2,934                                                  |
| 1879   | 1,945                                                       | -486                                                                                    | +483                                                                                                             | 1,942                                                      | 1,204                                                                                         | 3,146                                                                                 | 67.0                                                    | 3,349                                            | 2,674                                                  |
| 1880   | 1,932                                                       | -483                                                                                    | +511                                                                                                             | 1,960                                                      | 926                                                                                           | 2,886                                                                                 | 59.4                                                    | 2,969                                            | 2,395                                                  |
| 1881   | 2,045                                                       | -511                                                                                    | +464                                                                                                             | 1,998                                                      | 1,419                                                                                         | 3,417                                                                                 | 72.5                                                    | 3,626                                            | 2,768                                                  |
| 1882   | 1,857                                                       | -464                                                                                    | +317                                                                                                             | 1,710                                                      | 1,396                                                                                         | 3,106                                                                                 | 64.0                                                    | 3,198                                            | 2,454                                                  |
| 1883   | 1,270                                                       | -317                                                                                    | +250                                                                                                             | 1,203                                                      | 755                                                                                           | 1,958                                                                                 | 40.6                                                    | 2,029                                            | 1,508                                                  |
| 1884   | 1,002                                                       | -250                                                                                    | +242                                                                                                             | 994                                                        | 769                                                                                           | 1,763                                                                                 | 36.3                                                    | 1,817                                            | 1,322                                                  |
| 1885   | 966                                                         | -242                                                                                    | +184                                                                                                             | 908                                                        | 934                                                                                           | 1,842                                                                                 | 39.3                                                    | 1,967                                            | 1,345                                                  |
| 1886   | 737                                                         | -184                                                                                    | +58                                                                                                              | 611                                                        | 511                                                                                           | 1,122                                                                                 | 23.1                                                    | 1,158                                            | 797                                                    |
| 1887   | 233                                                         | -58                                                                                     | +21                                                                                                              | 196                                                        | 275                                                                                           | 471                                                                                   | 10.0                                                    | 502                                              | 325                                                    |
| 1888   | 85                                                          | -21                                                                                     | +8                                                                                                               | 72                                                         | 242                                                                                           | 314                                                                                   | 6.5                                                     | 326                                              | 210                                                    |
| 1889   | 31                                                          | -8                                                                                      | +4                                                                                                               | 27                                                         | 145                                                                                           | 172                                                                                   | 3.6                                                     | 179                                              | 114                                                    |
| (1890) | (17)                                                        | —                                                                                       | —                                                                                                                | —                                                          | —                                                                                             | —                                                                                     | —                                                       | —                                                | —                                                      |

\* For the years given in this table, the total numbers of vaccinations have been obtained as follows :—(a.) For the years 1849-62 inclusive, the number of public vaccinations performed in each year ending the 29th of September has been taken from the yearly returns made to the Poor Law Board, and an estimate made, as shown above, of the number performed in each year ending the 31st of December. There being no official information in existence giving the actual number of private vaccinations performed in these years, one-fifth of the number of public vaccinations in each year has been taken as a fair approximation of the number of operations performed by private practitioners, and that proportion has accordingly been added to give the total number of vaccinations in each of these years (1849-62). (b.) For the years 1863-67 inclusive, and for the first half of the year 1868, the total numbers of vaccinations have been abstracted from the vaccination registers, in which all vaccinations, both public and private, are entered. (The number of public vaccinations in each of these years, except the year 1864 (see below), and throughout the table with that exception, has been obtained as for the years 1849-62. The number of private vaccinations in each of the years 1863-89, except the year 1864 (see below), has been obtained by deducting the number of public vaccinations from the total number of vaccinations in the same year.) (c.) For the last half of the year 1868 and for the years 1869-89 inclusive, the total numbers of vaccinations represent the actual numbers (derived from the vaccination registers) of vaccinations, including both public and private, in respect of which the Vaccination Officer has received fees within those years.

† Although for the purpose of reference the estimated numbers of public and of private vaccinations are given in this table, no use whatever has been made in any other of my tables or diagrams (except in Diagram A.) of the distinction between public and private vaccinations, the totals only being used.

‡ The "extra vaccinations," 1863-64. Owing to the Small-pox epidemic which prevailed there were 4,320 additional public vaccinations performed in 1863-64. This number has been arrived at as follows. For the year ending the 29th of September 1864, the return made to the Poor Law Board gave the number of public vaccinations performed as 5,853, while the number of current public and private vaccinations abstracted from the vaccination registers, for the same period, was only 1,839. One-sixth of this latter number, namely, 306, requires deducting for the current private vaccinations, leaving 1,533 ordinary public vaccinations to be subtracted from the above abnormal number (5,853) of public vaccinations. The remainder, 4,320, is therefore the number of public "extra vaccinations" for the period mentioned. No addition has been made for any extra private vaccinations which may have occurred.—J. T. B.



## APPENDIX IV.

(See Questions 14,817-23, 15,175-221, 15,304-26 and 15,368-85.)

REPORT TO THE LOCAL GOVERNMENT BOARD BY MR. J. NETTEN RADCLIFFE ON CERTAIN CASES OF ERYSIPELAS, FOLLOWING UPON VACCINATION, IN THE MISTERTON DISTRICT OF THE GAINSBOROUGH UNION, LINCOLNSHIRE, AND IN ADJOINING DISTRICTS OF THE SAME UNION AND OF THE EAST RETFORD UNION.

[1] The following is the Report I have to present concerning cases of erysipelas,\* several fatal, following upon vaccination, in the Misterton district of the Gainsborough Union, Lincolnshire, and in adjoining districts of the same Union, and of the East Retford Union. Earliest in order of occurrence, and giving occasion, in the first instance, to the present inquiry, were the cases in the Misterton district of the Gainsborough Union.

It was during the investigation of these cases that the cases happened which have taken place in adjoining districts of the same Union and of the East Retford Union, and which are included in the present inquiry.

Following the order of the inquiry, I proceed to describe, first, the cases which occurred in the Misterton district of the Gainsborough Union. All these cases were among children who had been vaccinated by the public vaccinator for that district, Dr. Thomas Bell Wright, of Walkeringham, the greater number in the performance of that gentleman's public duties. The inquiry as to these cases has been one of considerable difficulty. The register of public vaccination has not been kept in a manner to be relied on, and Dr. Wright has no record of the events about to be described. He has, however, willingly given such help as he could from memory, but his memory of the different occurrences is very imperfect. The chief source of information has been the statements of the parents of the children, checked as far as possible by other available evidence. In every instance, where practicable, the cases themselves have been examined. In framing this Report I have had the help of notes taken by my colleague, Dr. Beard, in a preliminary investigation of the cases made by him. I had also his personal assistance in the early part of the inquiry.

The following is a relation of the several cases and of the facts necessary to be recorded connected therewith, as gathered from the sources indicated:—

During the last week of September and first week of October of the present year (1876), Dr. Wright, with a view to the approaching half-yearly vaccinations in his district, vaccinated five children on the days respectively stated, viz., Edwin George Baker, aged three months, on September 25th; Walter Burdon, aged five months, on September 26th; Sarah Bates, aged six months, Elizabeth Ann Doughty, aged five months, and William Mead, aged six months, on October 2nd, all of Walkeringham. The lymph employed was probably some dry lymph on "points" which had been supplied to him on the 23rd September from the National Vaccine

Establishment. The vaccination succeeded in one only of those children, namely, Walter Burdon.\* The vaccination in this case had been done according to Dr. Wright's ordinary practice, by scarifications on the arm, the "points" charged with dry lymph, after having been moistened by the breath, being then rubbed over each scarified place. Four scarifications, it is said, were made, but the vaccination succeeded in two places only, giving rise to vesicles which in their development and decline appear to have followed a regular course, no untoward symptom being manifested from beginning to end. The vesicles are described as having been rather small, but plump and well formed. On the day week after vaccination (3rd October), Dr. Wright inspected the child's arm, and took lymph on "points" from the vesicles. The number of "points" which he charged from them cannot be precisely stated, but need not have exceeded 15 or 16. It is Dr. Wright's habit to use but one "point" for each child when he vaccinates, and the information obtained renders it probable that 15 vaccinations were performed with "points" charged with lymph from Burdon.

The "points" used for charging in the above case were, Dr. Wright states, old points which had been previously used, but which before again using he had carefully cleansed by first steeping them in hot water and then wiping them until dry on a towel.

After charging the points, as above stated, it is tolerably clear that the vesicles were not exhausted of their lymph, and there is reason to believe that Dr. Wright went on to vaccinate one child (*Henderson*) direct from the arm of Burdon, and that he further charged a lancet with lymph and used it thus charged in a vaccination subsequently performed (*Baker*).

After the removal of the lymph from Burdon's arm, the vesicles showed no signs of irritation other than usually accompanies the formation of the areola. Indeed, according to the mother, the areolar inflammation was somewhat less in amount than she had observed during the progress of vaccination in six others of her children who had been successfully vaccinated in their infancy by Dr. Wright. The pocks died away in ordinary course, scabs were duly formed, and the vaccinated arm presents now two well-marked vaccine cicatrices.

Burdon is a healthy-looking and lively child, and no indication of disordered health have been detected in the several examinations to which he has been subjected by Dr. Beard and myself.

With the lymph taken from Burdon on the 3rd October, it is highly probable that altogether 16 children were vaccinated. The names of these children and some of the more important data relating to this inquiry, are given in the following Table.

\* The term *erysipelas* is used in this Report in its ordinary clinical sense, as signifying a diffusive inflammation of the skin, which may exhibit very different characters according as it is limited to the superficial cutaneous structures, or as it may include the deeper structures. No expression of opinion is intended to be implied or expressed on the pathology of the different forms of affection which are ordinarily grouped together under the common designation erysipelas. Simply, for the immediate practical purpose of the Report and for the convenient description of the several forms of diffusive inflammation of the skin observed in the cases considered in it, the term in common usage to designate such forms is adopted.

\* An attempt appears to have been previously made by Dr. Wright to vaccinate the child Burdon, and two other children, living at West Stockwith, with fluid lymph obtained from the National Vaccine Establishment. Of these attempts no record has been produced, but they were probably made between September 14th and September 23rd.



TABLE I.—Showing the Names of the Children Vaccinated by DR. WRIGHT, probably with Lymph taken on the 3rd October 1876 from WALTER BURDON, and some of the more important facts of the Cases.

| Name.                      | Age.         | Residence.      | Date of Vaccination. | How Vaccinated.   | Insertions of Lymph. |                    | Date of Inspection.      | Whether Lymph taken from Vesicles. | Progress of the Vaccination.                                                                               | Date of appearance of Erysipelas, if any. | Result.               | Remarks.                                                                                                                                                                                                          |
|----------------------------|--------------|-----------------|----------------------|-------------------|----------------------|--------------------|--------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |              |                 |                      |                   | Number made.         | Number successful. |                          |                                    |                                                                                                            |                                           |                       |                                                                                                                                                                                                                   |
| 1. Henderson, Joseph       | Months.<br>5 | Walkeringham    | 3 October            | Arm-to-arm        | 4                    | 3                  | 10 October               | No                                 | Regular                                                                                                    | 13 October                                | Death,<br>25 October. | The areolæ had declined by time erysipelas set in, and the erysipelas did not begin apparently at the seat of the vaccine pocks.                                                                                  |
| 2. Baker, Edwin George     | 3            | Do.             | 3 "                  | Lancet (charged). | 4                    | 3                  | 10 "                     | Yes                                | Regular                                                                                                    | 11 "                                      | Death,<br>19 October  | Erysipelas came on with the development of the areolæ. Note the hygienic conditions in which this child dwelt.                                                                                                    |
| 3. Cottam, Mary            | 2½           | Do.             | 6 "                  | Point             | 5                    | 4                  | Not seen again by Dr. W. | No                                 | Spurious and unhealthy throughout.                                                                         | 16 and 17 October.                        | Death,<br>31 October. | Apparently case of unhealthy wounds taking on erysipelatous action.                                                                                                                                               |
| 4. Hudson, Edith Anne      | 8            | Walkereth Ferry | 6 "                  | Do.               | 2                    | 2                  | 23 October               | No                                 | Vesicles not quite healed on the 27th day of vaccination.                                                  | 1 November.                               | Recovery              | —                                                                                                                                                                                                                 |
| 5. Clarke, Mary Jane       | 6            | Walkeringham    | 7 "                  | Do.               | 4                    | 1                  | 14 "                     | No                                 | Suppuration going on, on separation of scab on the 14th or 16th day.                                       | 19 October                                | Recovering<br>28 Nov. | Query, case of pyæmia properly so called, settling in on the 22nd day of the vaccination. The first signs of the disease were not manifested on the vaccinated arm.                                               |
| 6. Doughty, Elizabeth Anne | 5            | Do.             | 9 "                  | Do.               | 4                    | 0                  | ?                        | —                                  | Vaccination failed.                                                                                        | —                                         | —                     | —                                                                                                                                                                                                                 |
| 7. Parker, Charles Cooper  | 4            | Misterton       | 9 "                  | Do.               | 2                    | 2                  | 16 October               | No                                 | Vesicles not quite scabbed and discharging on 18th day of vaccination (ascribed to chafing of dress but?). | 26 October                                | Death,<br>27 October. | A remarkably acute case, setting in 18 days after vaccination, and long after the active general symptoms of vaccination had passed away. Child was in excellent health two days before. Began in vaccinated arm. |
| 8. Pikett, Matilda         | 7            | Do.             | 9 "                  | Do.               | 3                    | 3                  | 16 "                     | No                                 | Tops of the vesicles rubbed off by 8th day (said to be by accident, but?), and lymph discharged.           | 16 "                                      | Recovered             | Abscess below forefold of armpit, vaccinated limb.                                                                                                                                                                |
| 9. Woodhouse, John George  | 7            | Do.             | 9 "                  | Do.               | 2                    | 2                  | 16 "                     | No                                 | One of the (two) vesicles not scabbed by 18th day.                                                         | 3 November.                               | Death,<br>16 Nov.     | Erysipelas did not appear till the 25th day of vaccination, and after the scab had separated.                                                                                                                     |



| Name.                           | Age.         | Residence. | Date of Vaccination. | How Vaccinated. | Insertions of Lymph. |                    | Date of Inspection. | Whether Lymph taken from Vesicles. | Progress of the Vaccination.     | Date of appearance of Erysipelas, if any. | Result.          | Remarks.                                                                                                                                                                                                                                                                                |
|---------------------------------|--------------|------------|----------------------|-----------------|----------------------|--------------------|---------------------|------------------------------------|----------------------------------|-------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |              |            |                      |                 | Number made.         | Number successful. |                     |                                    |                                  |                                           |                  |                                                                                                                                                                                                                                                                                         |
| 10. Smith, Florence Elizabeth - | Months.<br>8 | Misterton  | 9 October            | Point           | 3                    | 3                  | 16 October          | Yes                                | Course regular throughout.       | —                                         | —                | Apparently a somewhat excessive areola with subsequent peeling of skin on the spot. On the 16th November, mother states (child not seen) cicatrices reddening since 14th, gland in armpit of vaccinated arm swollen. 28th November, child quite well, swelling and redness disappeared. |
| 11. Wilson, Wilby               | 3            | Do.        | 9 "                  | Do.             | 4                    | Aborted -          | 16 "                | —                                  | Abortive vaccination             | —                                         | —                | 16th November, eczematous eruption scalp, said to have followed vaccination. Erythematous bluish above an enlarged cervical gland on the vaccinated side, and recent erythematous blotches on the chest.                                                                                |
| 12. Scott, Alice Laura          | 8            | Do.        | 9 "                  | Do.             | 3                    | 3                  | ?                   | No                                 | Regular                          | 14 October                                | Death,<br>5 Nov. | On the sixth day of vaccination. Case possibly complicated with scuriantina.                                                                                                                                                                                                            |
| 13. Crookes, Walter             | 7            | Do.        | 9 "                  | Do.             | ?                    | 0                  | ?                   | —                                  | Vaccination failed.              | —                                         | —                | —                                                                                                                                                                                                                                                                                       |
| 14. Grey, Alice                 | 4½           | Beckenham  | 11 "                 | Do.             | 4                    | 2                  | 22 October          | No                                 | Course regular throughout.       | 9 November                                | Recovered        | A slight erysipelatosus attack, apparently not beginning at, but below, the seat of vaccination on the vaccinated arm, 30 days after vaccination.                                                                                                                                       |
| 15. Matthews, Gertrude          | 3            | Do.        | 11 "                 | Do.             | 4                    | 1                  | 22 "                | No                                 | Do.                              | —                                         | —                | —                                                                                                                                                                                                                                                                                       |
| 16. Armstrong, John Henry       | 4            | Do.        | (?) 11 "             | Do.             | 3                    | 0                  | 22 "                | No                                 | Vaccination failed.              | —                                         | —                | —                                                                                                                                                                                                                                                                                       |
| Do. (2nd vaccination)           | —            | —          | (?) 18 "             | Do.             | 3                    | 3                  | Not inspected       | No                                 | Vesicles said to be well formed. | 25 October                                | Do.              | An extension of areola approaching to erysipelas.                                                                                                                                                                                                                                       |



Of the series of 16 cases given in the foregoing Table, all probably vaccinated with lymph taken from the child Burdon, the vaccination was more or less successful in 12 (that is to say, one or more apparently normal vesicles were developed in each of those cases); in one case (Cottam) the vesicles did not form regularly, no lymph having been secreted in them; in another case the vesicles aborted; and in two cases the vaccination was unsuccessful. In 10 of the 12 cases in which the vaccination was more or less successful, erysipelas was developed, and in the case which was spurious (Cottam) erysipelas also occurred.

## SUMMARY.

|                                 |   |   |   |    |
|---------------------------------|---|---|---|----|
| Cases vaccinated in this series | - | - | - | 16 |
| With more or less success       | - | - | - | 12 |
| Spurious                        | - | - | - | 1  |
| Aborted                         | - | - | - | 1  |
| Without success                 | - | - | - | 2  |

|                                     |   |   |   |    |
|-------------------------------------|---|---|---|----|
| Cases of erysipelas in the series   | - | - | - | 11 |
| Of which among the successful cases | - | - | - | 10 |
| The spurious case                   | - | - | - | 1  |

The dates of appearance of erysipelas in the several cases are given in the Table. The following is a summary of the periods intervening between vaccination and the beginning of the erysipelas, the latter as shown by the appearance of the inflammatory action on the surface of the skin:—

Erysipelas appeared—

|                                                  |  |
|--------------------------------------------------|--|
| On the 6th day of vaccination in 1 case (Scott). |  |
| „ 8th „ „ 2 cases (Pickett and Armstrong?).      |  |
| „ 9th „ „ 1 case (Baker).                        |  |
| „ 11th „ „ 2 cases (Henderson Cottam).           |  |
| „ 13th „ „ 1 case (Clarke).                      |  |
| „ 18th „ „ 1 case (Parker).                      |  |
| „ 26th „ „ 1 case (Woodhouse).                   |  |
| „ 27th „ „ 1 case (Hudson).                      |  |
| „ 29th „ after „ 1 case (Grey).                  |  |

With reference to the different cases of erysipelas in this series of vaccinations, the facts relating to the character of the disease, the mode of its development, and the conditions under which it occurred in each case affected appear (so far as these facts could be ascertained under the circumstances of the inquiry) to have been as follows:—

1. *Henderson (Joseph, aged five months; Walkeringham).*—This child, as already stated, was probably vaccinated direct from the arm of Burdon after a number of “points” had been charged from the vesicles of that child. The vaccination succeeded in three out of four scarified spots into which lymph was inserted, and appears to have pursued a regular course until the areolæ began to die away. At the mother’s request no lymph was taken from the vesicles by Dr. Wright when he inspected the child the day week after vaccination. On the third day following inspection (13th October) the mother first noticed redness and some swelling of the vaccinated arm below the vaccine pocks. The redness and swelling (the former becoming brighter and more “fiery” in aspect as it extended, and the latter becoming tenser) spread downwards to the tips of the fingers and upwards to the shoulder and back. The symptoms of general disturbance of the system increased step by step with the progress of the affection of the skin, and the latter became dark and livid within the area of inflammation as the case drew to an end. The child died on the 25th October, the 22nd day after vaccination. The cause of death was certified by Dr. Wright (who attended the case throughout) as “Erysipelas, 6 days [duration].”

The parents in this case occupy a small cottage adjoining the cottage in which the parents of Burdon live. Henderson’s cottage is wholly without drainage, and the ground immediately in front of the door was at the time of the inquiry saturated with slop-water.

2. *Baker (Edwin George, aged three months; Walkeringham)* was also vaccinated on the 3rd October with lymph taken from Burdon. The operation was performed at the child’s own home, and, according to the mother, it was affected by scarification in four places with a lancet, no point being used, whence she inferred

that the lymph was carried upon the lancet. Dr. Wright is unable to say positively whether this was the case or not, but he states that it is a very rare exception indeed for him to use lymph carried on the point of a lancet. The operation succeeded in three of the scarified places, and vaccination in them followed its ordinary course until the eighth day (10th October), the resulting vesicles being well formed and plump. On the evening of that day, the day week after vaccination, the child looking well and freely taking its food, which consisted partly of the mother’s milk, partly of rusks and corn flour, Dr. Wright visited it at its own home, punctured the vesicles, and charged several points with lymph from them.\* The father and mother state definitely (Dr. Wright’s memory not helping him in this matter) that 10 “points” were charged. After the removal of lymph Dr. Wright directed a “cold poultice” (apparently, in this case, simple water dressing) to be applied. During the night of the 10th–11th October the child became restless and feverish, and the next morning (11th October) the vaccinated arm was observed to be swollen and of a dark red colour (“nearly purple”) from the elbow to the shoulder. On the 12th the redness and swelling spread down the arm to the tips of the fingers, but there was some lessening of the swelling of the shoulder. From this date to the morning of the 18th the swelling of the affected arm generally became less, but the redness remained. During the night of the 18th the child had a convulsive seizure, and it was discovered (on the occasion of giving the child a warm bath) that its thighs had become swollen, hard, and of a slight purple colour, parts of the trunk also being similarly affected. The general disturbance of the system now became profound. Vesications formed on the red and swollen hand; the colour of the affected skin deepened, everywhere becoming livid; and the child died the day following, namely, the 19th October, the 17th day from vaccination. During the progress of these symptoms the vaccine vesicles, it is stated, exhibited no particular marks of irritation, and, after the removal of the lymph, they apparently dried and scabbed as in ordinary cases, unaffected by the erysipelatos phenomena on the arm and elsewhere on the body and by the accompanying general systemic disturbance. The cause of death in this case was certified by Dr. Wright (who was in attendance upon the case from the beginning of the erysipelatos symptoms) as “Retention of urine, diffuse inflammation of kidneys, bladder, and scrotum.”

The exterior structural arrangements of the school-house occupied by Baker’s parents, who have charge of the National School, are exceedingly discreditable. The principal living room looks upon a small yard surrounded by a high wall, in which are placed an earth-closet, the ash-bin, and the water-butts, the latter directly beneath the room window. The yard in fact forms a tank of comparatively stagnant air, liable at times to considerable fouling, and from which alone the principal living room can derive a supply of air through the window when this is opened.

3. *Cottam (Mary, aged two and a half months)* was vaccinated at the parents’ home, Walkeringham, on the 6th October. According to the mother’s statement, Dr. Wright in vaccinating the child scarified five spots on the left arm, using for the inoculation of the vaccine lymph one charged “point” only, which was rubbed in succession over the several scarified spots. The lymph presumably came from Burdon’s child, as Dr. Wright is not aware, and it does not appear probable, that he had lymph from any other source than in his possession. The day after vaccination (the 7th October) four of the scarified and inoculated spots were observed to be reddened, and this redness increased from day to day around the several spots, a pock forming at each spot. The pock did not present the same aspect as the mother had been accustomed to see after vaccination in others of her children. A “white top” did not form. On the 12th October, the seventh day of vaccination Dr. Wright, the mother states, not having seen the child in the interval, the family (the father being a foreman platelayer of the Great Northern Railway) was moved from Walkeringham, a station on the Doncaster and Gainsborough Railway, to Postland, Crowland, a station on the Spalding and March Railway. During the journey the tops of the pocks were rubbed off by the chafing of the child’s dress, and the sores thus made discharged, it is stated, “a reddish coloured water.” At this time the

\* It should be noted here that, according to the mother, Dr. Wright sharpened the point of his lancet, before pricking the vesicles, upon an emery needle-sharpener belonging to a sewing machine, which she lent to him at his request for the purpose.



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inflamed areas surrounding the different pocks were separate from each other, but presently they coalesced and formed a continuous swollen patch of redness. About the 16th or 17th October redness and swelling began to extend from the circumference of this patch, and continued spreading until they had involved the whole of the skin of the vaccinated arm, of the neck and scalp, of the trunk, of the right arm as low down as the knuckles, and of the legs to a short distance below the knees. The redness, according to the mother's words, "spread like a fire, and wherever the redness went there was much swelling." The swelling on both arms was very tense. Several vesications formed on the left arm and fingers, also on the buttocks and where the vesications became ruptured on the buttocks a raw surface was exposed which gave off a sanious discharge and occasionally bled. The child died on the 31st October. The parents stated that up to 29th October the child had had no medical attendance. On that day it was visited by the assistant of Dr. Crowden, of Gedney Hill, Wisbeach; and the cause of its death was certified, by Dr. Crowden, as "pyæmia."

4. *Hudson (Mary Anne*, aged seven months, *Walkereth Ferry*) was vaccinated at home by Dr. Wright, on the 6th October, with lymph taken from Burdon on a "point." Two insertions of lymph were made, both of which were successful. Dr. Wright does not appear to have seen this case again after vaccination until the 30th October. The vaccination, according to the mother's statement, followed a regular course until the 1st November. On that day (the 27th from its vaccination), the pocks having then almost but not quite healed, the lower pock became red and inflamed, and the redness with swelling spread afterwards from the inflamed pock along the arm, below to the wrist and above to the shoulder. Together with the setting up of this inflammatory action in the skin, the child lost appetite and had much febrile disturbance. This state of things continued for about a week, when the condition of the arm began to improve (but not until several vesications had formed upon it), and the general disturbance of the system abated. At the beginning of the inflammatory action in the skin Dr. Wright was sent for by the parents, and he had medical charge of the case. This child was seen by Dr. Beard and myself on the 14th November and the skin of the affected arm was found mottled and rough as compared with the skin of the other arm. The upper vaccine cicatrix was imperfect, the lower tolerably good.

5. *Clarke (Mary Jane*, aged six months; *Walker-ingham*) was vaccinated on the right arm at home on the 7th October in four places with lymph taken from Burdon, on a "point," on the 3rd October. The vaccination succeeded in one place only. Here the resulting vesicle followed seemingly a normal course until the time of scabbing. What was the quality of scab formed I cannot state, but on the 14th or 15th day of vaccination the scab separated and purulent matter was discharged from beneath. Before this happened, that is to say, on the 13th day of vaccination (the 19th October), it was observed that there was some soreness on the child's body on the left side (the side opposite to the vaccinated side); and the next day (the 20th) the leg on the same (the left) side became inflamed. Subsequently a large abscess formed on the shoulder of the vaccinated arm, another on the outer ankle of the left leg, and a third on the body just below the outer fold of the child in the interval between the soreness of the left side and the formation of the abscesses has not been obtained, but the general disturbance of the system during this period had been so great that there seemed little likelihood of the child's life being saved. When this child was seen by Dr. Beard and myself on the 16th November an open sore discharging purulent matter and surrounded by a broad ring of hardened tissue, above which the skin was red and glossy, existed where the abscess on the left outer ankle had been; and a large indolent unruptured abscess occupied the side of the chest beneath the anterior fold of the right armpit. Dr. Wright appears to have visited this child from time to time during the progress of vaccination and of the subsequent erysipelas, but it is not clear on what particular days his visits were made, and he apparently had not medical charge of the case. No lymph was taken from the vesicle after it had matured. The position of the vesicle on the right arm is now shown by a fairly good cicatrix. Above this cicatrix is a cicatrix left by the abscess which had existed on the shoulder. This child was last seen by me on the 27th November, when it appeared to be steadily and surely improving.

The ulcer on the outer ankle of the left foot was much better. The abscess on the right side of the body was not seen, but was described by the mother as dying away.

6. *Doughty (Elizabeth Ann*, aged five months; *Walker-ingham*) was vaccinated by Dr. Wright at his surgery on the 9th October with lymph probably taken from Burdon on a "point." The lymph was inserted in four scarified places, but the vaccination failed. (This child was afterwards vaccinated with lymph from another source. For the results of this second vaccination, see a subsequent part of this Report, p. 10.)

7. *Parker (Charles Cooper*, aged four months; *Misterton*) was vaccinated at the Misterton vaccination station on the 9th October with lymph said to be taken from Burdon on a "point" six days before (3rd October). Two insertions were made on the left arm, both successfully. The resulting vesicles, when the arm was inspected by Dr. Wright at the station the day week after vaccination, appear to have been good, but no lymph was taken from them. Nothing unusual seems to have occurred with respect to the child to arrest the father's and mother's attention until the 18th day after vaccination (the 26th October). At that time the vesicles had not quite scabbed over (it is suggested from chafing of the dress), and that there was a slight discharge from them. On the evening of the 26th October, after the child had eaten a hearty supper of bread and sop, it was noticed by the mother, while undressing it for bed, that the vaccinated arm (the left) was red from the elbow to the shoulder. In the course of the night the redness, seemingly without marked swelling, spread to the armpit (left), which became excessively tender, and down the left side of the body. As the redness extended, in the course of the 27th, the respiration would appear to have been greatly oppressed. The gravity of the symptoms rapidly increased as the evening of that day came on, the reddened portions of skin becoming livid, and at nightfall the child died, about 24 hours after the first signs of illness had been noted. This child was seen by Dr. Wright, in company with Dr. Beard, on the 27th, when it was lying in a moribund state. The cause of death was certified by Dr. Wright as "Pneumonia," 3 days [duration].

On the 24th October, the child being then apparently in excellent health, it had been carried by the mother to Gainsborough and back, on her visit to that town for the purpose of marketing, the day being the ordinary market day there. When there it was a good deal exposed. The mother travelled to Gainsborough, a distance of seven miles, in the morning by the carrier's cart and returned in the evening by rail as far as *Walker-ingham*, and thence on foot to her home, distant about two miles from the railway station. As she passed through the village of *Walker-ingham*, on her way homewards, she states that she did not stop at or have communication with any of the houses there.

A brother of this child's (*William Henry Parker*, aged three years), who was continually playing about the infant's cradle and with the infant, is believed by the mother and father to have inoculated a small sore he had at the root of the right thumb-nail with the discharge coming from the unhealed vaccine vesicles. During the night of the 26th-27th, the night following the evening when his infant brother became ill, this child, *William Henry*, was exceedingly restless and cried much, and in the morning the right thumb was discovered to be red, swollen, and very painful. Suppuration followed at the root of the nail, and until the pus had vent the child did not obtain relief from the pain and swelling. When this child was seen on the 16th November the end of the thumb was red and partially peeled, the process of peeling being still in progress.

8. *Pikett (Matilda*, aged seven months; *Misterton*) was vaccinated on the 9th October at the vaccination station, *Misterton*, with lymph taken from Burdon on a "point." Three insertions of lymph were made in the left arm, two successfully. The progress of the vaccination appears to have been regular until the eighth day (the 16th October). On that day the child was taken to the station for inspection. The tops of the vesicles had then been accidentally (?) rubbed off and the lymph discharged. The same day, contemporaneously with the formation of the areolæ, sharp febrile disturbance set in, and the areolæ, losing their regular circumscribed character, merged into a spreading inflammation of the skin, which presently involved the whole of the vaccinated limb and the corresponding side of the body. Below the anterior fold of the armpit of this side a large abscess formed. The child was seen by Dr. Beard on the 27th October. Then two deep ulcerated pits existed at the



points of vaccination; and redness extended from the fingers to the shoulder of the vaccinated arm (the left) and over the corresponding side of the chest. The arm, moreover, was oedematous, and some peeling of the cuticle had begun. On the 9th November, when the child was again seen, the redness and oedema of the arm had much diminished. Between the 9th and 14th November, a large abscess formed and opened below the left armpit. On the 27th November, when this child was last seen by me, the abscess had healed and the child recovered.

9. *Woodhouse (John George, aged seven months; Misterton)* was also vaccinated at the Misterton vaccination station on the 9th October with lymph taken from Burdon on the 3rd of the month on a "point." One point was used by Dr. Wright, and lymph from it was successfully inserted in two scarified places on the left arm. The arm was inspected by Dr. Wright on the 17th October, but the vesicles were not then sufficient developed to admit of lymph being taken from them, and none was taken then or afterwards. Except a little retardation in the development of the vesicles, the progress of the vaccination would appear to have been regular to the time of their maturity; nor did the after-course of the vesicles present anything to arrest the attention until the 26th, when the seat of the lower vesicle, which had not scabbed like the seat of the upper one, is stated to have become inflamed. Dr. Wright, who saw the case on that day, directed it to be poulticed. After the application of a poultice, and before the close of the day the inflammation, according to the mother, subsided. Dr. Beard visited this child, in company with Dr. Wright, the day following (the 27th October). The scabs had then come off and cicatrization was apparently proceeding normally, but slight redness was observed about the points of vaccination. Except this slight redness, nothing special was noted further by the mother until the 30th October, when she found that the child shrunk and cried when the side of the body corresponding to the vaccinated arm was touched. On the fourth day following (3rd November) a swelling in the armpit of the vaccinated arm was first noticed; about the same time it was observed that the tender side had become red and swollen. From the side the redness and swelling spread to the right shoulder and arm. On the 9th November Dr. Beard saw this case again and found great oedema of the left shoulder with erysipelatous inflammation extending over the left half of the chest. Afterwards the inflammation involved the whole of the left arm from the shoulder to the tips of the fingers and the greater part of the trunk on both sides, including the throat. Vesications appear to have formed on the breast, and there it reason to believe that deep-seated suppuration occurred in the left pectoral region. The child died on the day following (the 10th November), the redness of the affected parts deepening to a purple tint before the end came. The cause of death in this case was certified by Dr. Wright as "Inflammation of thorax and arm, ten days [duration]."

10. *Smith (Florence Elizabeth, aged eight months; Misterton)* was vaccinated on the 9th October at the Misterton vaccination station with lymph taken from Burdon on a "point." Three insertions of lymph were made, all successfully, and the vaccination seemingly followed a regular course to the full development of the vesicles. Dr. Wright, when the child was brought for inspection to the station on the 16th October, took lymph from the vesicles, charging probably over half-a-dozen points from them. The areolar inflammation which followed appears to have been somewhat excessive, but it passed off without any ill consequences, and the vesicles dried up, scabbed, and the scabs separated in ordinary course. There was some peeling of skin over the spot occupied by the areola. On the 14th November, according to the mother, the points of vaccination reddened, the redness covering an area round each cicatrix of about the size of a shilling, and at the same time a "lump" appeared in the armpit of the vaccinated arm. When this child was seen by me on the 27th November, the redness about the vaccine cicatrices and the lump, the mother stated, had disappeared, no ill effects on the child's health having, so far as could be ascertained, been produced by them, and the child was quite well. The arm was not examined, for reasons not requisite to to detail here.

Adjoining this house is an open stagnant ditch, reported to receive the drainage of a butcher's yard. The stench from this ditch, when the locality was visited by Dr. Beard on the 9th November was almost unendurable.

11. *Wilson (Wilby, aged three months; Misterton)*

was vaccinated at the same time as several previous cases, on the 9th October, at the vaccine station, Misterton, with lymph from Burdon, taken on a "point." Four insertions of lymph were made, and in all of them the vaccination at first appeared as if it were about to prove successful. Papules only, however, formed, on a size somewhat less than a pea, and then died away without becoming vesicles. Following upon this abortive result, according to the father and mother, a fugacious eruption, occurring in crops, appeared upon the face, and a more permanent eruption on the scalp. The child was seen by Dr. Beard and myself on the 16th November when the face was found free from eruption, but the scalp was covered with an eruption of an eczematous character. A gland, lying below the left ear, behind the angle of the lower jaw, was swollen and hard and the skin above it reddened. Three small erythematous blotches, which had made their appearance the day before, existed also on the front of the chest. I saw the child again on the 27th November, when the appearances above described, with the exception of the eruption on the scalp, had disappeared. This child was doubtless incubating eczema at the time of its vaccination.

12. *Scott (Alice Laura, aged eight months; Misterton)* was vaccinated on the 9th October at the Misterton vaccination station, with lymph from Burdon, taken on a "point." Three insertions of lymph were made on the left arm, all successfully. On the 14th October the arm became inflamed and swollen at the vaccinated spots. The redness and swelling then spread from these spots over the whole arm, including the hand and fingers, next extended to the left side of the body, and afterwards passed to the right side and the right arm and to the thighs. The whole surface of the trunk was involved in the diffusive inflammation. The skin of the left (the vaccinated) arm is described as having been distended almost to bursting. On the right arm vesications occurred. Dr. Beard saw this case on the 27th October, when he observed a deep ulcer at each of the three points of vaccination, and an erysipelatous blush over the left side of the chest. The skin was peeling on the vaccinated arm at this date. The father described the state of the inflamed parts on the eighth day of vaccination by the words "as red as fire." The child died on the 5th November. The cause of death in this case was registered by Dr. Wright as "Scarlatina, erysipelas, three weeks [duration]." The cottage occupied by the parents of this child is small, without through ventilation, and overcrowded with its present occupants.

13. *Crookes (Walter, aged seven months; Misterton)* was vaccinated unsuccessfully with lymph from Burdon, on a "point," at the Misterton vaccination station, on the 9th October.\* This child had no erysipelas.

14. *Grey (Alice, aged four and a half months; Beckenham)* was vaccinated on the 11th October at the Beckenham vaccination station with lymph on a "point," said to be charged from Burdon. Four insertions were made, but two only were successful. The vaccination appears to have followed its regular course. The vesicles formed well, and after maturity they dried up and scabbed without any drawback. No lymph was taken from them. According to the mother Dr. Wright did not inspect the arm until the 22nd October. On the 9th November, 30 days after vaccination an erysipelatous rash appeared on the arm immediately below the vaccine cicatrices and spread over the upper arm and shoulder, the child losing appetite and becoming fretful and feverish. Dr. Beard and I saw this child on the 14th November. The mother stated that the day before the child's arm had been "like a fire." The day of our visit the redness of the skin was dying away, and the affected portions felt hard and somewhat brawny, the child shrinking from the touch. The child's general health appeared to have suffered little from the attack.

15. *Matthews (Gertrude, aged three months; Beckenham)* was vaccinated at the Beckenham vaccination station on the 11th October, according to the vaccination register, with lymph from Burdon on a "point." Four insertions were made, but one alone succeeded. The vesicle from this insertion followed a natural course, and when the child was seen by Dr. Beard and myself on the 14th November the scab had become detached and there was promise of an excellent cicatrix. No lymph had been taken from the vesicle. The arm had been inspected by Dr. Wright on the 22nd October, when he ordered a bread poultice to be applied to the pock, with the object

\* The parents of Crookes had removed to Boston at the time of the inquiry, but Dr. Beard saw the child there (Nov. 10) and ascertained the facts stated in the text.



App. No. 4. as it would seem of facilitating the decline of the areolar inflammation.

16. *Armstrong (John Henry)*, aged four months; Beckenham) was also vaccinated but unsuccessfully at the Beckenham vaccination station the same day as the child Grey (11th October), with lymph on a "point," taken, it is stated in the vaccination register, from Burdon. This child was again vaccinated at the station on the 18th October, at this time also with lymph on a "point," said to be from Burdon. The vaccination on this occasion was successful, each of the three insertions producing well-formed vesicles. The areolar inflammation was considerable, and there was reddening and tumefaction of the arm from the wrist to the shoulder, and an extension of the redness to the neck during its continuance. The glands in the armpit also became swollen. The redness appears to have continued nearly a fortnight. No lymph was taken from the vesicles. This child, according to the mother, was not seen by Dr. Wright after its vaccination.

The series of cases above described does not include the whole of the vaccinations performed by Dr. Wright after the successful vaccination of Burdon on the 26th September. Twelve other children, so far as I have been able to ascertain, were vaccinated by him in the district; two during the period of the first series, three on the same day (18th October) as the last of that series, and the others within seven days after the completion of the series. The last of these vaccinations was performed on the 25th October. The child *Doughty*, moreover, unsuccessfully vaccinated in the first series of cases, was again vaccinated with lymph from another source on the 6th November. After this date Dr. Wright desisted from the operation. None of the thirteen children here referred to were vaccinated, it is believed, with lymph taken from Burdon. The lymph used in these cases came from different sources, not all of which have been ascertained. The names of these children, and the principal facts connected with their vaccination, are given in the following Table :—



TABLE II.—SHOWING the NAMES of CHILDREN VACCINATED by Dr. WRIGHT, during OCTOBER and NOVEMBER 1876, with LYMPH other than that taken from  
WALTER BURDON, and some of the more important facts of the Cases.

| Name.                    | Age.          | Residence.      | Date of Vaccination. | How Vaccinated. | Insertions of Lymph. |                    | Source of Lymph.             | Date of Inspection. | Whether Lymph taken from Vesicles. | Progress of the Vaccination.                                                                     | Date of appearance of Erysipelas, if any. | Result.    | Remarks.                                                                                                                                                                                                    |
|--------------------------|---------------|-----------------|----------------------|-----------------|----------------------|--------------------|------------------------------|---------------------|------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |               |                 |                      |                 | Number made.         | Number successful. |                              |                     |                                    |                                                                                                  |                                           |            |                                                                                                                                                                                                             |
| 1. Topham, Joseph        | months.<br>12 | Walkeringham    | 10 October           | Point           | 4                    | 2                  | Baker, E. G.<br>(10 October) | 17 October          | No                                 | After 8th day tops of vesicles rubbed off (said to be by accident), and pocks became open sores. | 28 October.                               | Recovered. | Erysipelas of vaccinated arm not started from sores, beginning 19th day of vaccination and lasting three days only.                                                                                         |
| 2. Briton, Christiana    | 4             | West Stockwith. | 13 "                 | Do.             | 4                    | 1                  | Not known                    | 20 "                | Yes                                | Apparently regular to 8th day, as lymph was then removed.                                        | 20 October.                               | "          | An extension apparently of the areola, so as to involve the whole arm.                                                                                                                                      |
| 3. Staples, Edith        | 6             | Bole            | 18 "                 | Do.             | 4                    | 3                  | "                            | 25 "                | No                                 | Apparently regular                                                                               | —                                         | —          | —                                                                                                                                                                                                           |
| 4. Chamberlain, Ann      | 6             | West Stockwith. | 20 "                 | ?               | ?                    | 3                  | Briton, C.<br>(20 October)   | 27 "                | No                                 | "                                                                                                | —                                         | —          | —                                                                                                                                                                                                           |
| 5. Turner, Rose Allen    | 6             | Do.             | 20 "                 | ?               | ?                    | 1                  | Not known                    | 27 "                | No                                 | "                                                                                                | —                                         | —          | —                                                                                                                                                                                                           |
| 6. Wood, Robert          | 5             | Do.             | 20 "                 | ?               | 4                    | 2                  | Briton, C.<br>(20 October)   | 27 "                | Yes, 9th day                       | "                                                                                                | —                                         | —          | Excess of areola, and an enlarged gland in armpit (17th Nov.), which went away without consequences.                                                                                                        |
| 7. Procter, Ellen        | 5             | Do.             | 20 "                 | ?               | ?                    | success.           | Briton, C.<br>(20 October)   | 27 "                | No                                 | "                                                                                                | —                                         | —          | —                                                                                                                                                                                                           |
| 8. Harris, Ruth          | 5             | Do.             | 20 "                 | ?               | ?                    | "                  | ?                            | 27 "                | ?                                  | —                                                                                                | —                                         | —          | This child not seen. According to a statement of the father's the areolar inflammation would appear to have been great.                                                                                     |
| 9. Ludlow, George Fredk. | 5             | Do.             | 20 "                 | Point           | 3                    | 3                  | Briton, C.<br>(20 October)   | ?                   | No                                 | Apparently regular                                                                               | —                                         | —          | 17th Nov. cicatrices good. Axillary gland observed enlarged 29th Nov., more than five weeks after vaccination.                                                                                              |
| 10. Robinson, Arthur     | 4             | Bole            | 25 "                 | Do.             | 4                    | 2                  | "                            | 1 November          | No                                 | "                                                                                                | —                                         | —          | —                                                                                                                                                                                                           |
| 11. Atkinson, Emily      | 12            | Do.             | 25 "                 | Do.             | ?                    | 2                  | "                            | 1 "                 | ?                                  | "                                                                                                | —                                         | —          | —                                                                                                                                                                                                           |
| 12. Atkinson John James  | ?             | Do.             | 25 "                 | Do.             | 3                    | 0                  | ?                            | ?                   | —                                  | —                                                                                                | —                                         | —          | —                                                                                                                                                                                                           |
| 13. Doughty, Eliz. Ann   | 6             | Walkeringham.   | 6 November           | Do.             | —                    | 1                  | Singleton<br>(4 November)    | 14 November         | No                                 | Imperfect                                                                                        | 26-27 November.                           | Recovered. | Erysipelas limited to buttocks and posterior parts of thighs, and appearance preceded by purging and vomiting. The lymph used in this case was obtained by Dr. Wright from Mr. Kaynes, Gungley-on-the-Hill. |



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Of the vaccinations here tabulated the results were as follows :—

|                         |   |   |                              |
|-------------------------|---|---|------------------------------|
| More or less successful | - | - | 11                           |
| Imperfect               | - | - | 1 ( <i>Doughty</i> ).        |
| Unsuccessful            | - | - | 1 ( <i>Atkinson, J. J.</i> ) |
|                         |   |   | <hr/> 13 <hr/>               |

Among these cases there occurred :—

|                                                                    |                                           |
|--------------------------------------------------------------------|-------------------------------------------|
| Erysipelas (localised)                                             | 3 ( <i>Topham, Briton, and Doughty</i> ). |
| Excessive areolar inflammation with enlargement of axillary glands | - 1 ( <i>Wood</i> ).                      |
| Ditto with axillary abscess                                        | - 1 ( <i>Ludlow</i> ).                    |

The erysipelas appeared—

|                                  |                       |
|----------------------------------|-----------------------|
| On the 8th day of vaccination in | 1 ( <i>Briton</i> ).  |
| „ 19th „ „                       | 1 ( <i>Topham</i> ).  |
| „ 21st „ „                       | 1 ( <i>Doughty</i> ). |

The cases complicated with erysipelas and with glandular enlargement alone call for description here, the other cases presenting nothing exceptional in their course so far as their history could be obtained.

*Topham (Joseph, aged one year; Walkeringham).*—It has been stated in the account of the series of cases vaccinated with lymph taken from Walter Burdon, that lymph was taken on “points” from the child Edwin George Baker on the day preceding that on which the erysipelas which proved fatal declared itself. With some of the lymph thus collected Dr. Wright vaccinated Joseph Topham on the 10th October. Four insertions of lymph were made on the left arm, two of which were successful. The vesicles formed well, but after reaching their full growth (the lymph not being removed from them) the tops were accidentally rubbed off and the pocks converted into open sores. These dried and scabbed over slowly, and before they were wholly closed an erysipelatous inflammation of the skin of the arm set in, not starting from the sores. This inflammation first showed itself on the 19th day after vaccination (28th October); it spread over the whole arm from the shoulder downwards, and it was accompanied by a swelling of the axillary glands and some soreness of the contiguous side of the body. After three days’ continuance the erysipelatous redness subsided and disappeared. The child was seen by Dr. Beard and myself on the 15th November. The sores on the arm had then healed, and small cicatrices were forming.

*Briton (Christiana, aged four months; West Stockwith).*—This child was vaccinated by Dr. Wright on the 13th October with lymph collected on a “point,” but it is not known from what source the lymph was obtained. Four insertions were made, but one only successfully. Erysipelatous inflammation of the arm was set up with the areolar inflammation the day week after vaccination, subsequently to the removal on that day by Dr. Wright of the lymph from the vesicle. The inflammation extended over the entire arm from the shoulder to the knuckles. This child was seen by Dr. Beard and myself on the 17th November. At that time the skin of the vaccinated arm was unpliant, and mottled from the previous inflammation; and the place where the pock had been presented an angry-looking scar on a hardened base, wanting the aspect of a proper vaccine cicatrix. I have learned that since this the child has gone on well.

*Doughty (Elizabeth Ann, aged five months; Walkeringham).*—This child was vaccinated a second time on the 6th November, a first attempt at vaccination on the 9th October (as related in a previous part of this Report, p. 5) having failed. The lymph for the second vaccination had been obtained by Dr. Wright on “points” from Mr. Raynes, of Gringley-on-the-Hill, and had been collected on the 4th November, from an infant, named Harriet Singleton, who had been vaccinated on the 27th October, and of whom more hereafter (p. 11). One only of four (?) insertions of lymph proved successful, and the resulting pock did not follow a regular course. The scab, small and imperfect, had not fallen from the pock when this child was first seen by Dr. Beard and myself on the 15th November. The arm was inspected by Dr. Wright on the 14th November.

On the 26th November, towards the latter part of the day, this child was seized with vomiting and purging. On the morning of the 27th the buttocks were

found by the mother to be red and inflamed, as if they had been scalded, and the child was very feverish. The redness in the course of the day spread over the whole area of the buttocks, over the vulva, and down the backs of both thighs to their middle. This child was seen by me on the 29th November. At this time the erysipelatous inflammation had begun to recede and the sensitiveness of the affected skin (before great) to diminish. The buttocks were still swollen and of a dusky red colour, and the vulva was denuded of cuticle and covered with a thin sero-purulent discharge, as if there had been vesication of the part, but none had been observed by the mother. The febrile disturbance of the system had passed away, and the child, although much wasted since my previous visit, was obviously mending rapidly. The scab had fallen off the point of vaccination, leaving a small discoloured mark, but no proper vaccine cicatrix. There had not been any signs of irritation or inflammation about the seat of the pock, and no indication of glandular disturbance could be traced in the vaccinated arm. The seat of the erysipelatous inflammation appeared to have been determined by irritation from the contact of the diarrhoeal stools with the skin of the buttocks.

*Wood (Robert, aged five months; West Stockwith).*—This case was vaccinated on the 20th October with lymph collected from Briton the same day. Two out of four insertions were successful, and the vaccination appears to have followed a regular course except that the areolar inflammation was excessive. The vesicles ruptured naturally on the 9th day. This child was seen by Dr. Beard and myself on the 17th November, and at that time the skin about the cicatrices was still reddened and an enlarged gland (first noticed by the mother the day before) existed in the armpit of the vaccinated arm, with a patch of reddened skin above it. The child was again seen by me on the 28th November, when the enlarged gland and redness of skin above it had disappeared, no ill effects having been observed from these symptoms during their continuance. The child seemed then quite healthy.

*Ludlow (George Frederick, aged five months; West Stockwith).*—This child was also, it is stated, vaccinated with lymph taken from Briton, the lymph having been collected on a “point.” This was the third attempt at vaccination since the beginning of September, the two previous attempts having failed. All the insertions made, three in number, succeeded, and the vaccination appears to have pursued a quite regular course, leaving good cicatrices. The child was seen and examined by Dr. Beard and myself on the 17th November. On the 2nd December, Mr. Stones, of Haxey (as he informs me in a letter dated the 5th December) was sent for to it in consequence of a swelling having formed and suppurated in the armpit of the right (the vaccinated) arm. The swelling had been first observed on the 29th November and the abscess to which it had given rise was discharging pretty freely when Mr. Stones wrote. [Afterwards (as Mr. Stones states in a letter dated 18th December) another abscess formed on the same side of the chest and the vaccine cicatrices became red and inflamed.]

To this point attention has been wholly occupied with the vaccinations performed by Dr. Wright in the several villages of the Misterton district since the 26th September, and especially with such of them as have been followed by untoward results. I have now to describe certain cases of erysipelas following upon vaccinations performed by other medical men; one of the cases occurring in the Misterton district, the others in neighbouring parts of adjoining districts. These cases have been, to the present, four in number, and all have taken place while this inquiry was in progress. The following is an account of the several cases, in the order of their occurrence.

*Sykes (William Henry, aged seven months; Leverton, East Retford).* This child was vaccinated by Mr. Rossiter, formerly of Leverton, now of Gainsborough, on the 25th October with lymph recently taken by him from a child, stated to be at that time and since in good health, in the neighbouring village of Sturton, and carried on glasses. The lymph was inserted successfully by two scarifications on the left arm, the resulting vesicles, it is said, being very fine. No lymph was taken from them, the arm not being inspected until the 10th day. At this date the pocks and the surrounding areola presented, Mr. Rossiter states, a normal appearance. On the 13th or 14th day after vaccination the elbow of the vaccinated arm was observed to be swollen and covered with a red rash. The swelling and rash gradually extended over the whole arm, the arm becoming much distended and of a livid colour. Subsequently the rash spread over the chest and attacked the opposite limb. This child was



seen by me on the 2nd December. The vaccinated arm was then covered with a dark red papular eruption, in the interspaces of which the skin appeared discoloured, rough and shrivelled as if after previous inflammatory action with much swelling. The papular eruption existed also on the front and left side of the chest and it covered a considerable portion of the right arm. The eruption, moreover, had appeared on the left side of the neck, and was continuous there below with the eruption on the shoulder, while above it was stated to be still spreading. This eruption appeared to have been developed subsequently to the erysipelatous condition of the arm and when this condition was subsiding and it seemed to be a separate phenomenon, dependent upon some morbid constitutional state which had been roused into activity by the vaccination or the erysipelas.

*Singleton (Harriet, aged three months; the Brick-yards Walkeringham).*—This child, after an unsuccessful attempt at vaccination on the 20th October, was vaccinated by Mr. Raynes, junior, of Gringley-on-the-Hill, on the 27th October. The lymph used was from a healthy child, and had been collected by Mr. Raynes, senior, on "points," on the 23rd October.\* Three insertions of lymph were made, all successfully. The resulting vesicles were reported as very fine, but as having ruptured spontaneously on the eighth day, when Mr. Raynes, junior, vaccinated successfully one child (Wm. Noble) direct with the escaping lymph and charged several points. Another child was vaccinated with this lymph as collected on "points" by Mr. Raynes, junior, the same day, but unsuccessfully. Several of the charged "points" were given to Dr. Wright, and with one of them the child Doughty, as before stated, was vaccinated. Harriet Singleton was seen by Dr. Beard and myself on the 15th November, and except that the pocks were not fully healed and that there was a considerable excoriation in the armpit from the chafing of too tight a sleeve, the child seemed in an excellent state of health and the vaccination most successful. On the day following this visit it appears erysipelas began in the vicinity of the pocks, and when the child was again visited by me on the 27th November, the inflammation of the skin had spread over the entire body, the head, and neck, and the limbs, except the left foot, along which the disease was then extending. [Subsequently, Mr. Raynes, senior, informs me, in a note dated the 27th December, the tissues lying beneath the skin became involved in the inflammation, and the child died on the 26th December.†]

The child which was vaccinated direct from the arm of Singleton (*William Noble, aged six months*) lives in an adjoining brickyard. Three insertions of lymph were made, all successfully. When seen by Dr. Beard and myself on the 15th November this child was very ill, suffering from bronchitis. One of the pocks had had the top rubbed off, and become ulcerated. Visiting this child again on the 27th November I found it recovered from the bronchitis, and with the ulcerated pock scabbed, but one of the axillary glands of the vaccinated side was considerably enlarged.‡

*Golding (Nelly, aged 5 months; Gringley brickyard).*—This child was vaccinated by Mr. Raynes, senior, on the 23rd October, with lymph taken on "points" from a child which had passed through its vaccination well, and which was seen by Dr. Beard and myself in good health. Four insertions of lymph were made, all successfully. The vaccination followed an ordinary course, and Mr. Raynes took lymph from the vesicles on the day week after the operation. On the 22nd November, the scabs meanwhile having fallen off the vaccinated spots, but two of them still oozing a little, erysipelas appeared at the spots, and presently spread over the whole arm and shoulder. This child was seen by me on the 29th November. The inflammation of the arm was then subsiding, but it had obviously been considerable, and there was still much swelling of the hand and fingers. There was also much enlargement and tenderness of the axillary glands of the affected side. The erysipelas afterwards extended

over the upper part of the trunk and to the opposite arm which it affected to the tips of the fingers. This child, according to the latest news 12th December, has recovered.

*Whitehead (Howard, aged three months; Haxey).*—This child was successfully vaccinated, on the 12th October, in four places on the left arm, by Mr. Stones, with lymph taken from a child who had been vaccinated with lymph obtained from the National Vaccine Establishment. Four other children were successfully vaccinated from the same child, the vaccination in each case being regular in progress throughout. The vaccination in Howard Whitehead followed an ordinary course, except that the areolæ were somewhat more diffuse and vivid than usual. Lymph was taken from the vesicles on the eighth day.

On the 27th November, upwards of six weeks from the vaccination, and long after the wounds caused by vaccination were healed, a diffuse rash, suggesting to the mother scarlet-fever, appeared on the breast and body of the child. The next day, the rash then disappearing, the skin of the hand of the vaccinated arm became red and the hand began to swell, the swelling and redness afterwards spreading up the arm. This case was seen by me on the 1st December. The affected hand was then much swollen, red, and glassy looking, and the erysipelatous inflammation had extended up the arm in front as far as the bend of the elbow, and behind almost to the axilla. The line of inflammation was still extending. The skin about the vaccine cicatrices and the cicatrices themselves (which were small, but well formed) were then quite free from inflammatory action, but there was enlargement of the axillary glands. Mr. Stones made a careful examination of the affected hand when he first saw the case, but he was unable to detect any sore there or breach of continuity of the skin. Writing on the 5th December, he states that the whole arm was then involved in the erysipelatous inflammation, and that the child was very poorly. The erysipelas subsequently spread over the abdomen and back and down the other arm, and the child died December 14th.

The parents of Sykes occupy a small farmhouse with premises in Leverton. The parents of Singleton and Golding occupy isolated houses situated on the Chesterfield Canal, in the vicinity respectively of Walkeringham and Gringley. The parents of Whitehead occupy an isolated house out the village of Haxey. This house otherwise very orderly in its precincts, has a small disused farmyard in the rear which at the time it was seen by one of us was foul and contained a large pool of stagnant water.

The cases last related make the total number of instances of erysipelas in children who had recently been vaccinated (which have come to my knowledge during the present inquiry) eighteen, and of these eight have ended fatally. Before considering the question of the probable source or sources of this formidable complication it seems to me desirable to bring together, in one view, the facts relating to the time of appearance of erysipelas after the performance of vaccination in the several instances. These facts are as follows:—

#### Erysipelas appeared—

|                                                             |  |
|-------------------------------------------------------------|--|
| On the 6th day of vaccination in one case ( <i>Scott</i> ). |  |
| " 8th " " 3 cases ( <i>Pikett, Briton, and Armstrong</i> ). |  |
| " 9th " " 1 case ( <i>Baker</i> ).                          |  |
| " 11th " " 2 cases ( <i>Henderson and Cottam</i> ).         |  |
| " 13th " " 1 case ( <i>Clarke</i> ).                        |  |
| " 13th-14th " " 1 case ( <i>Sykes</i> ).                    |  |
| " 18th " " 1 case ( <i>Parker</i> ).                        |  |
| " 19th " " 1 case ( <i>Topham</i> ).                        |  |
| " 21st " " 2 cases ( <i>Singleton, Doughty</i> ).           |  |
| " 25th " " 1 case ( <i>Woodhouse</i> ).                     |  |
| " 27th " " 1 case ( <i>Hudson</i> ).                        |  |
| " 29th after " 1 case ( <i>Grey</i> ).                      |  |
| " 30th " " 1 case ( <i>Golding</i> ).                       |  |
| " 46th " " 1 case ( <i>Whitehead</i> ).                     |  |

In some of these cases the connexion of the erysipelas with vaccination was, to say the least, very remote. In Doughty's case there would seem to have been no appreciable connexion at all.

Having thus completed, from the sources of information open to me, an account of the cases, I proceed to submit the following observations upon them.

The first question which presented itself for consideration was whether the untoward results recorded

\* The child from which the lymph was taken was vaccinated on the 16th October, and the vaccination followed a regular course from beginning to end. On the 2nd November, this child was attacked with scarlet fever, and it died from this disease on the 9th November. The scarlet fever afterwards attacked four other children of the family and the mother, and spreading to the next cottage three children there suffered from it. The cottages occupied by the two families adjoin each other and form an isolated building.

† At the time of the visit to Singleton's home on the 27th November, one of the children a boy, was suffering from enlarged cervical glands, the appearance of which, according to the mother, had been preceded by sore throat and a fugacious rash on the body.

‡ Mr. Raynes informs me that previous to the swelling of the glands in this case another child of the family had had sore throat followed by an abscess on one side of the neck which had required lancing, and that two other children had also had sore throats and glandular swellings in the neck which had dispersed without suppurating.



App. No. 4. were due to any careless or accidental inoculation of the infection of erysipelas at the time of the vaccination, or to any septic change which the lymph itself, though pure at the time of being taken, might have undergone in the interval between that time and its being used for the several vaccinations. Confining the observations for the present to what may be termed, for convenience, the Burdon series of cases, the facts are to be noted of all the vaccinations in that series having been performed by the same vaccinator, and with lymph probably all derived from one child; of the extreme severity of the greater number of the cases *earliest* vaccinated (Henderson, Baker, Cottam, Clarke); and of the large proportion in which the children vaccinated, as it is believed, with that lymph were attacked (11 out of 16). These facts strongly tended to the inference that something in the mode of performing the vaccination had contributed to, if not actually determined, the subsequent erysipelas, and all the circumstances connected with the performance of the operation were therefore subjected to minute inquiry.

The way in which the public vaccination had been carried on was altogether at variance with the instructions of the public vaccinator. The very important instruction to vaccinate, as far as possible, with liquid lymph direct from arm to arm was systematically disregarded. With respect to the mode of operating neither Dr. Beard nor myself had the opportunity of witnessing Dr. Wright perform vaccination, but we were enabled to satisfy ourselves that in several of the details connected therewith he was reprehensibly careless. The lancets he was accustomed to use when seen by Dr. Beard at the beginning of the inquiry were rusty, and when they were seen by me at a later date, though they had been partially cleaned and apparently sharpened on some coarse grained material, I found them dirty, both blades and handles, and in a state unfit for the performance of vaccination. Some "points" which he produced for examination can only be described as filthy. Again, it appeared that Dr. Wright had the habit of carrying mixed in the same packet, vaccine "points" which he had recently used, and unused charged vaccine "points." In a packet of this sort Dr. Beard and I found two used "points" smeared with blood at the tips, mixed with a number of unused charged "points." Such carelessness in regard to the performance of a delicate operation is a constant source of danger, and when it exists, if the vaccinator, in the course of his medical and surgical practice, should have been exposed to the infection of erysipelas, it is obvious that there might be opportunity for his infecting his lancets or "points," or the lymph with which one or both might be charged, in his manipulation of them. In the present case, although no suspicion of infection could attach to the lymph itself, as taken from the child Burdon (now, as throughout the whole course of vaccination, in excellent health), it was an important question whether the lymph obtained from that child might not have become infected while it was being removed from the pocks, in the process of charging the "points," or of its removal on the lancet. There was, of course, the further question whether, in the hands of a vaccinator habitually not careful, the lymph, which in most cases was not used till several days after it was taken, might not, by being carried about in his pocket during the interval, or by being otherwise improperly kept, have become spoiled.

I have given anxious attention to these several considerations, and submitted them to the most careful examination possible for me to institute under the circumstances, and I have to remark upon them as follows:—

[14] In the first place the supposition that the lymph, during its manipulation by the vaccinator, could have received any infection of erysipelas is rendered unlikely by the fact, that there was not, so far as I could ascertain, at the time when erysipelas manifested itself in Baker (the first attacked of the vaccinated children who suffered from that disease) any prevalence of erysipelas in the Misterton district, nor in fact any case of that disease, except one in a farmhouse at some distance from the village of Walkeringham, with which case Dr. Wright, the public vaccinator, had not come in contact at all.\*

\* It is proper to mention here, although I do not hold it necessary to include the fact in the body of the report, that Dr. Wright had been in occasional attendance since February or March 1876 upon three members of a family in Misterton, each of whom had a large chronic ulcer of the scalp, which had been produced by a corrosive ointment ignorantly applied to the head. One of the cases, the mother of the family, was affected from time to time, it was reported, with erysipelous attacks. I examined the several cases, but the mother's account of her own illness and of Dr. Wright's attendances appeared to me to render it improbable that from this source any infection of erysipelas could have been derived.

Secondly, the hypothesis that the erysipelas was due to the lymph having been spoiled in keeping is, as regards two of the cases affected, inconsistent with the fact that there had, in them, been no keeping of the lymph. In the one (Henderson) the vaccination was probably performed direct from child to child, but certainly at a time immediately following the removal of the lymph from the vesicle; in the other (Baker) the vaccination was performed on the same day on which the lymph had been taken. There was, moreover, but one case (Cottam) in which unhealthy action in the vaccinated spot immediately followed the operation.

Thirdly, as regards nearly all these cases, the period after vaccination at which the symptoms of erysipelas set in is seemingly inconsistent with their having originated at the time of the performance of the vaccination from any introduction, either of erysipelas or of active septic or decomposing material. In all instances within my knowledge in which erysipelas after vaccination has been the direct result of inoculation with active septic material or with the infective products of inflammation, the symptoms of the erysipelas or other septic infection have manifested themselves sometimes immediately, and always within a very short time, as one, two, three, or four days, of the performance of the vaccination, and have materially modified, if they have not altogether impeded, the progress of the vaccine vesicle.

But in the cases now under consideration five complete days was the shortest time that elapsed in any case before the erysipelas manifested itself, and that in one case only; in all other cases the interval amounted to at least a week, and in the greater number to a much longer period, in one instance (Whitehead) the interval being even 46 days. The course of the vaccine vesicles to the formation of the areola, moreover, in all the 13 cases which were successful, except two (Scott and Cottam), was, as far as reliance could be placed on the statements made to me, fairly regular.

It was possible, however, that carelessness in the performance of vaccination might conduce to the production of erysipelas or other septic mischief in another way than has been suggested. Although, as previously stated, there was one instance only (Cottam) which exhibited any indication of unhealthy action set up at the points of vaccination immediately after the operation, and apparently depending directly upon it, there were several instances in which were observed certain variations from the ordinary course of vaccination in its later stages, shown in sluggishness of healing or in purulency of the pocks or in both these respects (Clarke, Parker, Woodhouse, Topham, Hudson, &c.), and in after development of glandular mischief (Wood, Ludlow, &c.). These unusual results, occurring together in such large proportion in the practice of one vaccinator, appear to point to some commonly operative cause beyond an accidental chafing of the pocks by a child's dress, or any individual peculiarity of a child's constitution; and this common cause is probably to be found in that habitual disregard of proper cleanliness and proper care in the performance of the vaccination which I have had to describe. The state of some of the points was eminently suggestive that something more than pure vaccine lymph was occasionally inserted.

So long as the pocks remained unhealed and were open sores they were liable (other things concurring) to become the seat of erysipelous action, or of other septic mischief. The enlarged glands, too, if they should become actively inflamed, were also likely (circumstances favouring) to form the starting point of erysipelous or other septic action.

The several considerations advanced do not, however, furnish a clue to the *origin* of the erysipelas among the vaccinated children. It was necessary to turn attention in another direction before this could be obtained. I have already stated that although there was, so far as could be ascertained, no general prevalence of erysipelas in the Misterton district, when the first case of erysipelas following upon vaccination occurred (Baker), there yet did exist one case of the disease at the time in the district. I am indebted to Mr. Stones, of Haxey, for the particulars of this case. The patient, a farmer, lives in an isolated house in Misterton parish. While from home late in September he had been attacked with a glandular abscess on the right side. He returned home on the 27th September, and on the 4th October the abscess burst spontaneously. The day following, the 5th October, erysipelous inflammation began at the edges of the aperture through which the matter had been discharged, and spreading thence it extended over the whole trunk, the right leg, and part of the left leg. Deep-seated suppuration occurred in the right thigh,



and the patient is only now convalescent. This case is of great importance as showing that erysipelas, notwithstanding its chief incidence in the district has been among recently vaccinated children, has not been limited in its attacks to, and did not even make its first manifestation among, such children. Nor was this the only case which occurred in persons who had not recently been vaccinated. The following case occurred in Walkeringham: A girl named Greaves, aged four years, living in that village, had a small lump formed on the inner side of the right arm, an enlarged gland doubtless, probably resulting from a fall upon the hands a few days before. It does not appear to have been noticed whether the child had grazed or otherwise broken the skin on the right hand at the time. On the 25th October the lump became inflamed, and Dr. Wright saw the child the same day. Contemporaneously with the beginning of active inflammation in the lump, or following close upon it, the erysipelatous inflammation began in the skin above the lump, and spread thence over the entire arm and shoulder. On the fourth day following there was much swelling in the right armpit, and the same day a scarlet eruption appeared over the right side and front of the body, and on the face. The next day the eruption disappeared, and at the same time the swelling of the axilla also. The inflamed lump in the arm suppurated, but the abscess did not open until the 15th November.

The first of the cases here recorded (the farmer) may have originated in infection contracted previously to the patient's return home, or it may have originated from local causes; but the probability, according to Mr. Stones, is in favour of the local production of the erysipelas. In this case the erysipelas appeared (5th Oct.) six days before the appearance of the disease in the child Baker (11th Oct.). Traumatic erysipelas, however produced, is one of the most subtly infectious of maladies, and it has been a question for anxious consideration whether the child Baker, in Walkeringham, may not have been exposed to infection from the farmer in Misterton parish. I have altogether failed to establish the likelihood of such exposure. The homes of the two families are about three miles apart, there is no direct intercourse between the families, and of indirect intercourse or communications which might have proved efficient in the carriage of infection from one to the other I have found no evidence. The relationship in time of the two cases naturally raises the question whether the later case may not really have been due to infection from the earlier case, although the mode in which the infection was conveyed had not been traced. At the same time it is quite consistent with our knowledge of the pathology of erysipelas to assume that each case may have originated independently of the other in local causes other than infection.

The case of the girl Greaves is different, for this occurred at a time when the child may have been exposed to several chances of infection from cases of erysipelas, and when the influence of this cause could not be discriminated from that of other possible causes.

The difficulty experienced in Greaves case of distinguishing between the action of infection and of other causes apt to determine erysipelas is exactly the same difficulty as was met with in the cases of erysipelas following upon vaccination. After the disease had once made its appearance in the person of Baker's child, there was more or less opportunity of infecting other susceptible children. As the inquiry has proceeded, this consideration has come more and more into prominence, and cases that at first appeared to have necessarily been independent of previous infection have disappeared one after another.

With reference to this subject we would observe, in respect to Dr. Wright, that he was in daily attendance upon the child Baker, the child who first manifested erysipelas after vaccination, from the 11th to the 19th October, and upon the child Henderson, the case next succeeding to Baker, from the 13th to the 25th October. It will be noticed, on reference to the tables, that these periods include the times of the greater number of inspections and four of the vaccinations in the Burdon series, and all the vaccinations but two (Topham and Doughty), and several of the inspections in the subsequent series. Very definite risks of conveyance of the infection of erysipelas to these children, or some of them would under such circumstances be incurred. It will further be observed that the greater number of cases of erysipelas in the Burdon series appears to have had a marked relation to the larger proportion of instances in that series in which the pocks healed sluggishly and formed open sores. The coincidence is noteworthy that

the case of Hudson was visited by Dr. Wright on the 29th October (the pocks then not being quite healed and that erysipelas appeared on the 1st November.\*

Other accidental sources of infection existed in the intercourse maintained between the different villages and outlying houses, and among the villagers themselves. This branch of the inquiry, rendering from its complexity a very large amount of time necessary to follow it fully out, has been only carried on to the point of showing that the nature of the intercourse was such as to render it impossible to exclude chances of infection having been conveyed through it in a number of the cases. It is, for instance, a probability that Parker's child contracted erysipelas in some unobserved way in passing through Walkeringham on the 24th October. Although the mother states that she did not call at any house in the village, her road homewards from the railway station would take her close to the two houses (the one standing a few feet back from the road on the one side, the other standing by the road on the otherside) where the children Henderson and Clarke were then lying exceedingly ill, the former near to death. It is probable, moreover, that the infection of erysipelas may have been carried to Whitehead's child at Haxey from Woodhead's or Pikett's child, at Misterton, in an indirect but likely way, disclosed only while I am now writing through a persistent investigation carried on by Mr. Stones in courteous aid of this inquiry. The histories of other infectious diseases show how frequently infections have been contracted when apparently there has been no near approach to the sick, the connecting link have been overlooked or forgotten.

The medical data, unfortunately, do not exist which would have made it possible to deal definitely with this question of infection in the several cases of erysipelas, but inasmuch as there were few, if any, of the cases in which, after the development of the disease in Baker, a liability to infection did not exist, I infer that it most probably played a considerable part in causing them.

It is interesting to note here in this connexion that in August of this year an outbreak of erysipelas occurred in the district lying to the north and east of Gainsborough. The disease, so far as the particulars have been ascertained, with one exception, attacked adults. The exception was a child recently vaccinated who was exposed to the risk of infection from adults suffering from the malady. Dr. Mackinder, to whom I am indebted for the information, has favoured me with the notes of eight cases of erysipelas (including the case of the vaccinated child) which came under his observation between the 3rd and 21st of August, in Morton, Corringham, and Yawthorpe. Three of the cases occurred in succession in one family, and the case of the vaccinated child was connected with this series. Four of the cases were very severe and one of the four followed upon the prick of a thorn in the hand. Dr. Mackinder has also reported to me a case of circumscribed erysipelas, visited by him at Morton on the 15th November, and which followed upon an abrasion of the skin of the arm in an adult.

I have two other observations to submit, bearing on the hygienic state of the district at or about the time of these occurrences. The cases of erysipelas in the Burdon series of vaccinations had been preceded at Walkeringham by the appearance of scarlet fever in the village, and this disease was prevalent in the village and vicinity during the vaccinations. It has been suggested that the concurrence of scarlet fever and vaccination in the same neighbourhood may sometimes lead to erysipelatous complications. So far as this inquiry has extended, it has disclosed nothing which would lead me to infer that any of the patients affected with erysipelas were, at the time of vaccination or during its progress, infected with scarlet fever. The other observation relates to an unusual prevalence of fatal diphtheria in the Gainsborough registration district. There were no less than 10 deaths from this cause in the Gainsborough registration sub-district during the three months ending September 29th among a population of 8,655.

In conclusion, I submit the following summary of the principal facts and conclusions of this Report:—

1. That at the beginning of this outbreak of erysipelas among recently vaccinated children the disease was not limited in attack to such children.
2. That in the vaccinated child first affected, the seizure followed close in order of time upon the

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\* It is not unimportant to observe in this connexion that Dr. Wright was summoned to a woman in childbed at Misterton on the 19th October who was being attended by a midwife. The placenta appears to have been attached, and he had to deliver it. A few hours after the operation the woman had rigors and she died on the 21st October.



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occurrence of a severe case of phlegmonous erysipelas in another part of the same district, and may like that case, as the information regarding these cases stands at present, have originated otherwise than in antecedent infection.

3. That of the subsequent cases of erysipelas following upon vaccination, the erysipelas may in some have arisen from like causes as in the first case; but, having regard to the infectious nature of the disease, to the communications which occurred between the first case and the subjects of the subsequent cases through the visits made by the public vaccinator whether for inspection or otherwise, and to the chances of transmissions of infection in the ordinary intercourse between the several villages and places in which cases occurred, and between the villagers themselves, it is probable that by far the greater number of the cases of erysipelas following upon the first case were produced by infection.
4. That it is quite certain that the lymph as furnished by Burdon did not convey any infection of erysipelas, and that there is no evidence to show that the vaccine lymph as obtained from other sources conveyed such infection.
5. That, nevertheless, certain details connected with the operation of vaccination as performed by the public vaccinator in the Misterton district, and notably the use of dirty lancets or dirtied "points," have probably exercised an important indirect effect in rendering the vaccinated children liable to erysi-

pelas, by causing the progress of vaccination in several instances to become irregular in some of its stages.

6. That the irregularities in the progress of the vaccination here referred to consisted chiefly (1) in sluggish healing and occasional purulency of the pocks after the areolar stage had passed—a condition of things not admitting of being wholly explained by mere accidental chafing of the pocks by the child's dress—and (2) in late developed mischief in the axillary glands of the vaccinated side.
7. That the unhealed pocks, forming for the most part open sores, afforded facilities for the reception of the infection of such erysipelas as was current in the neighbourhood, and for the setting up of erysipelatos or septic mischief in the sore from causes other than infection tending to such a result. Similarly, glandular irritation appeared to predispose to erysipelas, and this equally whether the irritation was consequent on vaccination, or whether it followed (as in two cases it did) upon local injuries independent of vaccination.
8. That there existed in the district at the time a peculiar tendency to the spread of erysipelas, such as is sometimes met with as existing in localities quite apart from any performance of vaccination, and of which the outbreak in August in the villages of Morton and Corringham, and at Yawthorpe, is an example.

16th December 1876.

J. NETTEN RADCLIFFE.

(See Questions 15,222-9 and 15,262-90.)

[3]

REPORT TO THE LOCAL GOVERNMENT BOARD BY MR. J. J. HENLEY AND DR. H. AIRY ON CERTAIN DEATHS AND INJURIES ALLEGED TO HAVE BEEN CAUSED BY VACCINATION AT NORWICH.

To the Right Honourable J. G. DODSON, M.P., President of the Local Government Board.

SIR,

IN accordance with your instructions of the 12th of August 1882, we held an official inquiry at the Board Room of the Norwich Union into the complaint of Mr. Lee Bliss as to the alleged deaths and injuries of certain children who were vaccinated in June last at the Public Station in Norwich by Dr. Guy, the Public Vaccinator for the Norwich Union.

We commenced the inquiry upon the 23rd August, and concluded it upon the 4th September 1882.

We annex (pp. 12-53) a copy of the depositions taken before us, together with our Report.

The complainants were represented by Mr. Corrie Grant, instructed by Messrs. Tillett, Solicitors.

The Guardians had retained the services of Mr. Blofield, who was present on the first day of the inquiry, and were subsequently represented by their clerk, Mr. J. Cross.

The Public Vaccinator was represented by Mr. J. C. Chittock, Solicitor, of Norwich.

The chairman, vice-chairman, and others of the guardians were present at the inquiry.

The eight cases first submitted to the Board, namely, Percy William Threadkill (No. 80\*), Emma Tyler (No. 83\*), Alice Lambert (No. 41\*), Maudie Colison (No. 71\*), Jacob Harvey (No. 82\*), May Brown (No. 91\*), Laura Girling (No. 92\*), and Henry Willsea (No. 85\*), were taken in their order.

The two supplemental cases, of Clara Worrell (No. 153\*), and Robert Warnes Balls (No. 497\*), were then investigated. The last case (that of Balls), not having arisen in connection with vaccination, was, by consent, withdrawn. (See Extract from Death Register, p. 59.)

In four out of the above nine cases, namely, Threadkill, Tyler, Lambert, and Colison, fatal results had followed.

We propose to deal in the first instance with these four fatal cases.

These four children were all vaccinated by Dr. Guy at the Public Vaccination Station in Norwich; Lambert on the 6th of June, the other three on the 13th.

Percy Threadkill died on 25th June, of "erysipelas," certified by William Guy, M.D.

Emma Tyler died on 26th June, of "erysipelas from vaccination," certified by John Crook, M.R.C.S.

Alice Lambert died on 26th June, of "erysipelas" certified by William Guy, M.D.

Maudie Colison died on 4th July, of "bronchitis," certified by William Guy, M.D.

(Although the death of the last-named infant is certified to have been caused by bronchitis, it was admitted by Dr. Guy, after hearing the evidence of other witnesses, that she must have been suffering at the time of death from erysipelas.)

These four children appear all to have been healthy before vaccination, and no evidence was produced to account for their illness from external causes. They came from different parts of the city, and no probable cause of the disease could be assigned, either from the state of health of their parents or of those with whom they had intercourse, or from the state of their dwellings or their surroundings. Attendance at the public station was the only condition common to all four cases. We shall have, therefore, to give especial consideration (below) to the circumstances that occurred at the public station on the days when these children were present.

Examining these cases individually, we find that Percy Threadkill (No. 80), a strong and healthy child, was vaccinated by Dr. Guy in the morning of the 13th of June with lymph taken on ivory points from the arm of Percy Arnes (No. 44), and within a very short period, probably two hours, after its vaccination, showed symptoms of illness which ripened into malignant erysipelas, and terminated in death on the 25th of June, 12 days after vaccination. The vaccination itself was successful, but the character of the vaccine vesicles was not normal.

It was suggested by Dr. Guy, who attended the child at its home, that a rag soaked in castor oil,\* or a bread poultice, which the mother had applied to the arm, might have exercised a "pernicious" effect. We may, however, at once set aside this theory, as the child was evidently sickening before any local applications were used; and, having regard to the nearly simultaneous occurrence of the same disease in other children having nothing in common except the circumstances of vaccination, we can only attribute its ailment and subsequent death to illness contracted at the vaccination station.

Evidence was brought forward by Dr. Guy to show that an elder child of Mrs. Threadkill had sores on her face, and Mrs. Threadkill admitted that the girl frequently kissed the baby. It appeared to be suggested

\* These numbers refer to the consecutive numeration of the cases as entered in the Public Vaccinator's Register.

\* The bottle containing the last drop of this castor oil was obtained and submitted to Dr. Klein, who, with the greatest care, tested it by means of experimental inoculations, but with purely negative results. We annex Dr. Klein's report.



that the baby's erysipelas might have arisen from this cause; but we found no reason to think that the sores on this girl's face was of an erysipelatous nature previous to the appearance of erysipelas in the infant.

The case of *Emma Tyler* (No. 83), vaccinated from *Armes* (No. 44), on the same day and in the same way with ivory points, was almost identical in its symptoms with that of *Threadkill*, though in *Tyler* the vaccination proved abortive, and the erysipelas was not so speedily developed, the mother not observing anything wrong with the child till between 7 and 8 o'clock the same evening.

This infant was attended in its illness by Dr. Guy and by Mr. Crook, and died on the 26th of June, the day after the death of *Percy Threadkill*.

Mr. Crook, who has practised for more than 40 years at Norwich, in describing the illness said, "I examined the arm. There was an erysipelatous appearance of the left arm extending from the vaccination marks up to the shoulder and down to the elbow, arising apparently from vaccination. In my opinion the erysipelatous appearance arose from no blame either in the vaccinator or in the vacciner. I have never seen such a bad case of erysipelas before or so soon after vaccination." Having given a certificate of death from "erysipelas from vaccination," he stated in his evidence that "this certificate still represents my opinion."

Mr. Crook, added "I do not think there would have been erysipelas if the child had not been vaccinated," and, questioned as to the scratch alone causing erysipelas, he said "If the child's arm had been scratched by a piece of glass, I do not think it would have produced the effect in this case nor so quickly."

It appears then that the two infants, *Threadkill* (No. 80), and *Tyler* (No. 83), healthy on the morning of 13th June, were taken to the station about 10 o'clock that morning and were vaccinated with points charged with lymph from *Percy Armes* (No. 44), and that soon after the operation they began to sicken with erysipelas, and died of that disease, from no apparent cause except something connected with vaccination. It also appears from the vaccination register (*see extract, annexed*) that two other children, *Coan* (No. 81) and *Harvey* (No. 82), were, with *Tyler* (No. 83), the only unsuccessful cases of vaccination out of a total of 33 children vaccinated on that day.

Thus in all the four children who were ostensibly vaccinated from *Armes*, vaccination was either unsuccessful or was attended by erysipelas. The significance of this fact will be considered below.

We now pass on to the other two fatal cases of *Lambert* (No. 41) and *Colison* (No. 71). *Alice Lambert* (No. 41) was vaccinated on the 6th of June, and was taken to the station on the 13th for inspection. The child was then quite well, and lymph was taken from its arm on points. It sickened upon the 15th, and died of erysipelas on 26th June. It was attended by Dr. Guy, who gave a certificate of death from "erysipelas."

The disease appears to have been of much the same type in this as in the former cases; but, as it did not commence till nine days after vaccination, the act of infection (which, if we have regard to the entire history of the outbreak, we must assume to have taken place at the station) probably occurred not on the day of vaccination, 6th June, but on the day of inspection, 13th June, when the vaccine vesicles were opened. The period of incubation, if reckoned from the date of vaccination, would be far beyond that mentioned by Mr. Netten Radcliffe in his Report to the Board on certain cases of erysipelas, following upon vaccination, in the Misterton District of the Gainsborough Union (p. 14).

"In all instances within my knowledge in which erysipelas after vaccination has been the direct result of inoculation with active septic material or with the infective product of inflammation, the symptoms of the erysipelas or other septic infection have manifested themselves sometimes immediately, and always within a very short time, as one, two, three, or four days, of the performance of the vaccination, and have materially modified, if they have not altogether impeded, the progress of the vaccine vesicle."

It may be mentioned that Mrs. Lambert attributed her child's illness to a cold caught through exposure at the door when the baby was in the charge of an elder girl.

The vacciner for Lambert's vaccination was *Alice Sewell* (No. 28). In consequence of some doubt as to the character of an eruption upon this child, we deemed

it our duty to order a special medical examination, by which it appeared that the disease was one common to children at this period of life, and was not specific. (*See page 31.*)

Five other children had been vaccinated from the same vacciner (*Sewell*) without injurious results, one of the five being *Percy Armes* (No. 44), the vacciner in the two previous cases of *Threadkill* and *Tyler*.

We find, moreover, that a child named *Edith Johnson* (No. 97) was on 13th June vaccinated from Lambert's arm, without any injurious result. This fact gives additional ground for believing that Lambert had not contracted the disease previous to the day of inspection.

The case of *Maudie Colison* (No. 71) in some respects resembles that of Lambert. The child was vaccinated on 13th June, and was taken ill on 21st June, the day after inspection. It was attended (once only) by Dr. Guy, who, although he gave a certificate of death from "Bronchitis," admitted, after hearing the evidence, that the child must at the same time have been suffering from erysipelas.

No evidence was given in this case to throw light upon the origin of the disease; but, if caused by something that occurred at the vaccination station, it should probably be referred, like Lambert's case, and for the same reason, not to the day of vaccination but to the day of inspection; and it must be borne in mind, in reference to this case, that for several days previous to 20th June Dr. Guy had been personally attending *Threadkill* and *Tyler* and Lambert who were suffering from erysipelas. It is also known that on the 20th the child *Girling* was present at the station with erysipelas.

In Colison's case, as in Lambert's, Dr. Guy opened the vesicles on the day of inspection, 20th June, and charged some points, with one or more of which he vaccinated a child named *Byles* (No. 104). In Byles, the vaccination followed a normal course.

The remaining five cases were less severe than the four above described.

*Jacob Harvey* (No. 82) had an attack of eczema four or five days after unsuccessful vaccination. Mr. Lyddon attended the child; he said the disease was common among children who had not been vaccinated, and that it might be attributed to many causes, such as over-crowding, bad food, bad air, or small scratches; it was not cognate with erysipelas; it was often the consequence of vaccination, but in this case he did not connect it with vaccination, because the vaccination had not taken.

*Harvey* was unsuccessfully vaccinated from *Percy Armes* (No. 44), the vacciner in the two first (fatal) cases, and that is the fact of chief importance in this case.

*May Brown* (No. 91), vaccinated on 13th June at the public station, with lymph from *Ellen Wicks* (No. 45), was taken ill with severe inflammation of the vaccinated arm about a week after inspection. The vesicles had been opened by Dr. Guy on the day of inspection, 20th June, and five or six points charged with the lymph, but there is no record of any of these points having been used for the vaccination of any other child. Mr. Lyddon attended the child *Brown*, and stated it to be a case of "erythema after vaccination." He said he repeatedly had cases of erythema in his own practice, but generally they were not quite so severe. The illness had resulted in no permanent injury to the child. Supposing it to have been of an erysipelatous nature, the disease appeared to be referable to the day of inspection, 20th June. We have already, in speaking of Colison's case, mentioned two possible sources of infection present at the station on that day.

*Laura Girling* (No. 92), was vaccinated, like *May Brown*, from *Ellen Wicks* (No. 45), on 13th June. On the next day the mother noticed that the child "looked sadly; was not so sprightly as before." The illness developed on the following Friday, three days after vaccination, into erysipelas, which remained confined to the vaccinated arm. The child was attended by Dr. Guy and Mr. Matthews. It recovered and is now well, and the disease, in Dr. Guy's opinion, is not likely to recur. No cause but something connected with vaccination could be assigned for this attack of erysipelas.

Besides *Brown* and *Girling*, five other children were vaccinated from the same vacciner (*Wicks*) without injury.

*Henry Willsea* (No. 85), was vaccinated from *Charles Davison* (No. 51) on 13th June, and was taken ill on 21st June, the day after inspection. The left leg swelled and gathered, and afterwards the right wrist. The child was attended by Dr. Guy, who said it suffered



App. No. 4. from abscesses, not due to erysipelas. Dr. Guy does not consider that any permanent injury will arise. The child was produced before us, and was not even at that date quite cured. No cause could be assigned for this attack, but assuming it to have been erysipelas (of phlegmonous character) it might be traceable, as suggested in Colison's case, to infection from Girling or from Dr. Guy himself.

Six other children were vaccinated from the same vacciner (Davison), without injury.

Clara Worrell (No. 153) was vaccinated from Lily Newman (No. 106), on 27th June. The mother noticed nothing the matter with the child till five days after inspection, when "spots came out on the back of the neck, and also on the eyelid." A week later the vaccinated arm became inflamed. Dr. Guy attended the child, and said the arm was generally inflamed and erysipelatous. The child was also seen, when recovering, by Mr. Allen, surgeon, of Norwich. It made a good recovery. No cause could be assigned for this illness, but it should be noted that on the day when this child was taken to the station for inspection (4th July) the child, May Brown, suffering, as Mr. Lyddon stated, from erythema, was also present.

Two other children were vaccinated from the same vacciner (L. Newman), without injury.

This closes the list of cases upon which we are reporting, and we have now to indicate such considerations as appear to us to arise from the evidence of the witnesses examined before us.

With regard to the general administration of the Vaccination Acts in Norwich, we find that no charge is brought against the Guardians, who are the body entrusted by the Legislature with that duty, and there was no evidence of any negligence on their part.

[7] Incidentally the question came before us of the suitability of the present vaccination station. One witness stated that the waiting-room was crowded, and we learnt that occasionally some of the women and infants had to be accommodated in a private room upstairs, to relieve the pressure in the waiting-rooms below.

Knowing the difficulty the Guardians have in finding a public room suitable for the purpose, and seeing the advantages of central position and general convenience attaching to the present station, which is at the private residence of the public vaccinator, Dr. Guy, we are disposed to think that the circumstances of the case would best be met by appointing two attendances in every week, instead of one, for the performance of public vaccination. The pressure at the station would thus be relieved; there would be less delay to the women, less risk of infection to the infants, and less confusion to the public vaccinator.

With regard to the mode in which the public vaccinator had performed his public duties, no charge was brought against him by the complainants, nor did it appear, in spite of confused admissions on his part, under a very severe examination by the counsel engaged on behalf of the complainants, that he had failed in carefulness or skill in the performance of his duty.

We think, however, that objection should be made to Dr. Guy's practice of using again and again the same ivory points in transferring lymph from arm to arm, for though it was stated that the same points were not used twice in the same day, and that after every day's using they were carefully cleaned, yet it is evident that some risk of septic contamination attaches to the practice; and we would repeat the recommendation which has before been given to Dr. Guy by the Board's Medical Inspector, when inspecting the work at the station, that he should discontinue the use of ivory points in his ordinary public vaccinations.

It might even be suggested that some of the points which were used on 13th June had by some accident or neglect become affected with a septic taint, which made them capable of causing erysipelas in children to whose abraded arms they were applied. But we find difficulty in understanding how, on this hypothesis, it could happen that the vaccinifer Percy Armes (No. 44), should escape being infected by the points applied so many times to its opened vesicles, while two out of four children vaccinated with those points caught malignant erysipelas, or how it could happen that Lambert's child should be infected in the act of taking its lymph, while the child Johnson, vaccinated from it, escaped, or how Girling should be infected while Ellen Wicks (the vacciner) escaped.

The vaccinifer, from whose arms lymph was taken for the nine vaccinations under inquiry, were proved to have been then and (with the exception of Sewell, see page 5), since, in apparently good health, with good

properly-formed vaccine vesicles on the day of inspection. No blame is cast upon the vaccinator in respect of the selection of any of these vaccinifer.

The chief facts relating to the source and pedigree of the lymph used in the vaccination of the nine children in question are given in a table appended to this Report (see page 66), on the authority of the vaccinator's register, by which it appears that the nine children were vaccinated from six different sources; that these six vaccinifer had themselves been vaccinated from four different sources; these four are traced back to two different sources on 23rd May; and, lastly, these two to one child, who had been vaccinated on 16th May, about a month before the occurrences which form the subject of this inquiry.

Lambert was one of six children vaccinated from Sewell (No. 28); Colison was one of three vaccinated from Marriott (No. 54); Brown and Girling were two of seven vaccinated from Wicks (No. 45); Willsea was one of seven vaccinated from Davison (No. 51); Worrell was one of three vaccinated from L. Newman (No. 106). There was no evidence of any ill result having arisen in the other 20 children vaccinated from these five sources. To these five vaccinifer at least there can attach no suspicion of having caused the illness of the six children above named.

Lastly, as to the vacciner Percy Armes (No. 44). Four children are registered as having been vaccinated from Armes, namely: Threadkill (No. 80), Coan (No. 81), Harvey (No. 82), and Tyler No. 83). Threadkill and Tyler contracted erysipelas. In Coan and Harvey, and also in Tyler, the vaccination proved unsuccessful.

The evidence of Mrs. Armes, the mother (who produced the child before us), supported by that of Dr. Guy, proved that the infant had always been in apparently good health. The vaccination ran the usual course, and upon the day of inspection Dr. Guy remarked to the mother, "What a nice arm your child has!" The child has been quite well ever since.

We therefore conclude that the child, Armes, was to all appearance a fit subject to be selected and used as a vacciner.

This is the only case in which the abnormal results of the vaccinations appear at first sight to inculpate the lymph. To this point we shall presently return.

Dr. Guy himself appears to have been not without suspicion as regards the vacciner, for he went to the house of Mrs. Armes to see her child; and it was deposed by two witnesses that he made use of an expression with regard to the state of health of the mother of the vacciner during her pregnancy, though he denied having used the words attributed to him.

That Dr. Guy was fully aware of the gravity of the occurrence appears from his remark to Mrs. Tyler, that he "would not have had it happen for a thousand pounds;" and also from the fact that he attended Tyler's and Threadkill's children gratuitously till their death, and gave a contribution through his wife towards the funeral expenses of the latter.

The question arises whether Dr. Guy, when he found on the 13th and 14th of June that there were at least three severe cases of erysipelas among children whom he had recently vaccinated, should not have felt it his duty at once to close the station and suspend public vaccination until he could feel satisfied that the danger of secondary infection had passed away. This would doubtless have been the proper course to take, in order to guard against extension of the disease; but we have to bear in mind that no similar case had occurred in Dr. Guy's previous experience during more than nine years; that it would be no light matter to disappoint the large number of persons who would present themselves at the station in the following week, to throw the work of the vaccination officer into arrear, and to stop the course of arm-to-arm vaccination; and that Dr. Guy might well think that if those who were first taken ill were kept away from the station, no subsequent harm to others was likely to arise.

We think that in continuing to attend the sick children at their own homes Dr. Guy may have incurred some risk of becoming himself a transporter of infection to others. It may be thought that Dr. Guy would have done better, having regard to his public duties, to have erred rather on the side of caution and to have abstained altogether from visiting these cases. We cannot ignore the possibility that some of the latter cases of erysipelas may have been due to infection brought by Dr. Guy from the bedside of one or another of the earlier cases he was attending. But we cannot condemn a course of action which we believe to have been prompted by a feeling of humanity as well as a sense of responsibility.

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It must be observed that the occasion was altogether an exceptional one, and one for which Dr. Guy was wholly unprepared by anything that had occurred in his previous experience, and we feel that under the urgent and alarming circumstances of the case it is not to be wondered at that his action should have been less circumspect than might have been desired.

Returning now to the question, what was the actual cause of the erysipelas from which most of these children suffered, and of which some of them died, we remark that very little evidence of a positive character bearing upon this question was brought before us at the inquiry and we are left practically to an examination of the vaccination register, and a discussion of the entries which it contains, as the principal means to enable us to form an opinion on the matter.

For this purpose we feel justified in taking the order of the entries in the register as representing the order in which the children were vaccinated. (See extract from the vaccination register, annexed, pp. 60-63.)

Referring to the vaccination register for 6th, 13th, and 20th June, the first name that we meet with, of those who suffered, is Lambert (No. 41); but this child though vaccinated on 6th June, was not taken ill till after inspection on 13th June. Probably, therefore (as already mentioned), this child's illness was contracted on the day of inspection, 13th June, when lymph was taken from its arm to vaccinate Edith Johnson (No. 97). Now Johnson's name appears in the register near the end of the list of vaccinations on 13th June. Therefore, we may suppose that Lambert's infection took place nearly at the close of the sitting on that day, and therefore subsequent to the vaccination of Threadkill, Tyler and others, which took place (according to the register) about the middle of the sitting.

The next name, in the register, of those who suffered is Colison (No. 71). Colison was vaccinated early in the sitting on the 13th June, but the illness in this case (as already described) cannot be referred to the day of vaccination, but probably arose from something that occurred on the day of inspection, 20th June, when lymph was taken from the arm.

Both these cases (Lambert and Colison), therefore have to be referred, in reading the chronology of the outbreak, to dates a week later than the dates of their vaccination; and we then perceive that the earliest moment to which the outbreak of erysipelas can be referred coincides with the vaccination of the child Threadkill (No. 80) from the arm of Percy Armes (No. 44). Up to that moment no mischief had been done. Thirteen children had been already vaccinated that morning who took no harm from the vaccination. Then come the four children that were vaccinated from Percy Armes. Two of them are attacked with erysipelas the same evening and die within a fortnight; in the other two the vaccination is wholly unsuccessful. It cannot be doubted that at that moment some poisonous agency came newly into the play at the station. We cannot divest our minds of the strong impression that the lymph used in vaccinating those children must have carried with it the elements of the disease which they subsequently developed.

We have considered the hypothesis that some person, possibly the mother of one of the children concerned, entering the station at that moment may have brought with her, unawares, the infection of erysipelas; but we fail to perceive how, on this hypothesis, we are to account for the conspicuous failure of the vaccination with this particular lymph.

That three out of these four vaccinations should have failed, in the hands of a uniformly successful operator appears to us to betoken almost necessarily some abnormal peculiarity or contamination of the lymph. But we cannot dissociate the failure of the vaccination in the three cases (Coan, Harvey, and Tyler from the occurrence of erysipelas in the two cases (Threadkill and Tyler), and suppose that these different results were due to two concurrent but wholly distinct causes. It is known, as appears from the words above quoted (page 5) from Mr. Netten Radcliffe's Misterton report, that the same cause which can produce erysipelas can also altogether impede the progress of the vaccine vesicle.

We feel justified in believing that the failure of the vaccination in some of the children vaccinated from Armes, and the production of erysipelas in others, were both due to the same cause, namely, some abnormal peculiarity or contamination of the lymph.

We have already stated (on page 7) the reason why we do not regard the state of the ivory points as the probable cause of the mischief. The evidence before us furnishes no other clue. Believing the child Armes to

have been healthy, and believing the uncontaminated lymph of a healthy child to be innocuous, we can only conclude that the outbreak was due to some contamination of the lymph which has escaped detection.

An opinion was put forward at the inquiry, that pure lymph taken from a healthy child and inserted in the arm of another healthy child might of itself cause erysipelas in the latter. We cannot entertain this opinion, in view of the habitual absence of erysipelas from the practice of vaccination. We conceive that if this opinion were well-grounded, erysipelas would habitually show itself in a sporadic manner at a station so largely frequented as that of Norwich. But the outburst of erysipelas with which we are concerned displays an epidemic and exceptional character which plainly negatives any theory that would make it depend upon the habitual operation of an ever-present cause.

We have here been dealing with the earliest group of cases. As regards the others, it appears that Lambert's illness, and also Girling's may probably be referred to the 13th of June, as the day when the infection was contracted. These two children appear by the register to have been present at the station at a later period of the sitting than the group that were vaccinated from Armes. In these later cases the illness was probably due, in some way which we cannot trace, to the same cause that had operated in the earlier cases on this day, 13th June.

Subsequently there was a group of cases (Colison, Willsea, and Brown) in which the illness was referable to 20th June. It is in relation to these cases that we have already spoken of Dr. Guy's personal attendance on Threadkill, Tyler, and Lambert. It seems possible that he may thus have communicated the infection to the later group on the 20th June. Also on that day the child Girling was brought to the station suffering from erysipelas. Here we see another possible source whence the later group may have derived infection.

Lastly, there is the case of the child Worrell, vaccinated on the 27th June, inspected on the 4th July, taken ill on the 9th July. It may be suspected in this case that the infection, if caught at the station, was caught on 4th July, possibly from the child Brown (No. 91), who was present at the station on that day suffering with severe inflammation of the arm.

Before leaving the question of the origin of this outbreak of erysipelas, we would refer to the evidence that was given as to there being any epidemic prevalence of erysipelas in Norwich at the time.

Dr. Guy had not recently had any case of erysipelas before 13th June.

Mr. Richardson, one of the district medical officers of the city, having in his district a population of 9,864, and also one of the medical officers of the Norwich dispensary, said "I think there has been rather more erysipelas in the city than usual in the last eight months. In my practice it has occurred in isolated cases, not groups. Roughly, eight cases pretty equally distributed over the eight months. They were not connected but eight isolated cases. So far as I know, there has been nothing that could be described as an epidemic of erysipelas in Norwich."

Mr. Crook had had no cases of erysipelas in his practice since February 1882.

Mr. Lyddon said, "My institute practice is principally amongst artisan classes. There are about 5,000 or 6,000 men, and their wives and children, representing about 10,000 or 11,000 persons. During last June there was more than the usual number of erysipelas cases. I should not think they were epidemic. I should say there were about half-a-dozen cases dotted about Norwich."

Mr. Allen had no cases of erysipelas in June or July last.

Mr. Matthews, an unregistered and not fully-qualified practitioner, said, "I have been consulted by women with vaccinated children in about 9 or 10 cases, from the city, in the last 12 months. Generally they were bad cases of erysipelas."

As far as this evidence goes, it gives reason to think that erysipelas was present in Norwich in greater amount than usual, though not to the extent of an epidemic; and so far it lends support to the suggestion that the infection might have been accidentally introduced into the vaccination station.

There appears to be nothing of any significance in the meteorological records for the week preceding the outbreak. (See extract annexed.)

Before concluding this report, we would again draw attention to what appears to us the very noteworthy fact, that during the nine and a-half years that Dr. Guy has

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been public vaccinator to the city of Norwich, vaccinating annually about 1,200 children, there has never up to present time been any public complaint of injury having arisen to any of the 10,000 children he has vaccinated. In this fact we see good ground to feel generally satisfied with the existing practice; and while we deplore the disastrous occurrence into which it has been our painful duty to inquire, we are yet happy to think that such an occurrence is of extreme rarity. It is no new discovery that there is a certain risk attending vaccination, but that risk is shown, by the figures here given, to be very small.

We have finally to consider to what extent the complaint of Mr. Lee Bliss, "that eight cases of death and "injury had resulted after the children in question had "been vaccinated by the public vaccinator of the city" has been substantiated.

As regards the several children in question; we find that Percy William Threadkill and Emma Tyler were vaccinated at the public station on the 13th of June and then and there contracted an illness (erysipelas) which caused their deaths on the 25th and 26th of June respectively; and although we are unable to assign with certainty a specific source of infection, the evidence raises a strong case of suspicion against the freedom from contamination of the lymph with which they were vaccinated.

[11] With regard to the case of Alice Lambert, who was vaccinated on 6th June, and died on the 26th June, and also with regard to Laura Girling, who recovered, we believe that the disease (erysipelas) was contracted at the station on 13th June, but no evidence was adduced that served to indicate the probable source of infection.

Maudie Colison, vaccinated on 13th June, died on 4th July, having probably contracted erysipelas on the day of inspection, 20th June. In the absence of any more direct evidence as to the transmission of the infection, we cannot ignore the possibility of the erysipelas having been communicated by the public vaccinator, who had shortly before attended Threadkill, Tyler, and Lambert, or by the child Girling, who was present at the station on the 20th.

Jacob Harvey, after unsuccessful vaccination on 13th June, suffered from eczema. The medical evidence appeared insufficient to determine whether the eczema was caused by the attempted vaccination or not.

May Brown suffered from erythema, hardly, if at all, distinguishable from erysipelas, probably contracted at the vaccination station on 20th June, and possibly due to one of the causes above suggested in Colison's case. No permanent injury has resulted.

Henry Willsea suffered from abscesses, probably the result of phlegmonous erysipelas, which might have been contracted at the vaccination station on 20th June, under the same circumstances as in the cases of Colison and Brown.

Clara Worrell suffered from erysipelas of the vaccinated arm, and recovered. The evidence was insufficient to warrant a conclusion as to the cause of the disease, but it may be suspected to have been due to the presence of the child Brown, with an inflamed arm, at the station on 4th July, the day of Worrell's inspection.

Lastly, we find that no blame was proved to attach to the Public Vaccinator as regards the performance of his duties at the station, or to the appliances at the station itself; but we think that the Public Vaccinator should discontinue the practice of using again and again the same ivory points, and we consider that it was an error of judgment on his part to continue the vaccination attendances while he was daily visiting the first three cases of erysipelas at their own homes, without taking more than ordinary precautions to guard against the spread of infection.

We also think that steps should be taken to relieve the crowding at the vaccination station.

We cannot close this Report without expressing our thanks to the different persons present at the inquiry, who without distinction afforded us every assistance in our endeavours to arrive at the truth.

We have, &c.

(Signed) J. J. HENLEY, General Inspector.

HUBERT AIRY, Medical Inspector.

21 October 1882.

(See Questions 15,222-9 and 15,262-90.)

MEMORANDUM BY THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD ON THE PROBABLE ORIGIN OF ERYSIPELAS AT THE NORWICH PUBLIC VACCINATION STATION IN JUNE 1882.

THE PRESIDENT,

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It has become my duty, as Medical Officer of the Board, to comment on the occurrences at the Norwich Vaccination Station last June, with especial reference to the causation of erysipelas there, and to the precautions that may be taken for avoiding such disasters in future.

Dr. Airy, in the inquiry which the Board entrusted to him on 11th July, found himself unable to establish the origin of the erysipelatous disease which he found to have attacked eight children attending the station; and he proposed to add to his usual methods of research a public inquiry, at which he might, perhaps, get further information that should throw light on this obscure question of the origin of the disease. It was thought well to give this public inquiry another and more formal character, but the object which Dr. Airy proposed to himself has been in a measure served.

Dr. Airy succeeded at the inquiry in eliciting the very important fact that the vaccination of children at the Norwich station, nominally performed from arm to arm, has been habitually done by the intervention of "points." This fact had not been discovered by Dr. Airy in his earlier inquiries, and it appears to me to deserve the most particular consideration.

Ivory points are used at Norwich in the transfer of lymph from the arms of children brought for inspection to the arms of children brought for vaccination. The arm of the child to be vaccinated is first punctured or abraded with a lancet, and the point charged with lymph taken from the previously vaccinated child is then rubbed in to the puncture or abrasion. This intervention of points is unnecessary in arm to arm vaccination, but some operators have a liking for it, and except for its introducing a new element, and therefore a new need for care, into the process, there is no objection to it, provided new ivory points are

used in every such transfer of lymph. But a wholly different question arises if such ivory points are used over and over again.

The mere washing of points that have been charged with an albuminous matter will not invariably remove the whole of such matter from the end of the point; and, as a further precaution, the washed end of the point may be rubbed on sand paper. But there must inevitably be particular occasions when, even in the hands of a habitually careful person, some portion of the cleansing processes will be overlooked or incompletely performed. The only safe rule in vaccination, therefore, is to consider an ivory point as a mere waste thing only fit to be destroyed, after it has once been charged with vaccine lymph and put to its intended purpose. Unless this rule be observed, the destination of the dirty or imperfectly cleaned ivory point is to be used again on some future occasion. It will have been a simple affair of accident whether the animal matter remaining by chance on its end has been kept dry and harmless, or whether it has undergone decay and obtained the qualities of a septic poison.

The occasion on which an imperfectly cleansed point will be used, and on which it will, if its old retained lymph have become decomposed, do mischief to the child to whom it is used in the operation of vaccination, must, in the nature of things, be difficult of detection, and very close and detailed examination of all the circumstances will be wanted before the fact of its use on a given occasion can be discovered.

Dr. Airy, until the public sitting, was unaware of Dr. Guy's continued practice of using points in the transfer of lymph from arm to arm; he had believed that Dr. Guy had, in deference to previous objections made by himself as the Board's inspector, abandoned the practice; and, indeed, Dr. Guy, while operating in the course of Dr. Airy's last inspection, and in



Dr. Airy's presence, had used his lancet, and not any point, in the process of transferring lymph.

In this way it has come about that very imperfect investigation has been made of the relation existing between Dr. Guy's practice of using the same points over and over again, and the occurrence of erysipelas at the Norwich Station in June. At the public inquiry counsel were engaged in accusing vaccination as such, and in defending Dr. Guy from any charge of neglect of duty. They were not there to discover possible accidents incidental to faulty practices of Dr. Guy's. And after the public inquiry, the question, which is so difficult, whether on certain occasions dirty or imperfectly cleaned points were made use of, has not been further gone into. Yet, without investigation of this question, it is certain that the Board is without information of the facts concerning one potent condition out of those which may have produced erysipelas at the Norwich Station.

Dr. Airy, in his report, made jointly with Mr. Henley, on the results of the public inquiry, recognises the probable importance to the question of causation involved in Dr. Guy's practice with ivory points. The inspectors having reported that "no charge was brought against" Dr. Guy in respect of carefulness or skill in the performance of duty, go on to reprehend the practice of using points over and over again; saying, "though it was stated that the same points were not used twice in the same day, and that after every day's using they were carefully cleansed, yet it is evident that some risk of septic contamination attaches to the practice."

But there is much more than this to be said concerning the share that transfer points, repeatedly used, may have had in the misfortunes of the Norwich Stations.

The cases of erysipelas occurring there in the practice of June last divide themselves into four, which are referable to 13th June; and four others (including one spoken of alternatively as erythema) referable to 20th June, or later. In the four former cases the erysipelas began, without exception, on the vaccinated arm, and it commenced immediately after the operation. Of the four latter cases, the three that were definite erysipelas got the disease commencing at another part of the body, and all four cases got it a week or more after the operation (the erythematous case commencing after rupture of the vesicles); the four latter, moreover, all had the opportunity of contracting the disease from infected persons actually in attendance along with them at the time and place where they received infection. Viewed in connection with the materials of vaccination, therefore, comparatively little importance can attach to the four later cases, and essential interest must attach to the four earlier cases only.

These four more important earlier cases were four children who came under operation in the second half of the sitting on 13th June. Three of the four were infected on the occasion of their vaccination, one on the occasion of taking lymph from it. The last (Lambert) gave no erysipelas to the child who was vaccinated from it, and Lambert's five fellow vaccinees had no erysipelas. The three infected on the occasion of their vaccination were vaccinated from two vaccinifers. Two of them, Threadkill and Tyler, were operated on from one vaccinifer, Percy Armes, along with two other children in whom no erysipelas was produced; and the third, Girling, was operated on from another vaccinifer, Wicks, along with five other children in whom no erysipelas was produced, and along with a sixth who did indeed contract erysipelas, but in whose case the disease probably dated from a later day.

According to the customary practice of medical inspectors, the distribution of disease would be studied for the light that the distribution could throw upon an obscure cause. Those four cases that are definitely referable to the events of the station on 13th June would particularly deserve to be interrogated for the discovery of some agent having a distribution corresponding to the cases; an agent, namely, that (1) had done its principal mischief at that one sitting, and that had come into operation in the middle of the sitting; that (2) could act independently on vaccinifer or vaccinee, but with a preference for the latter; that (3) could convey vaccinia and erysipelas together, or (always remembering the ability of one infection to supersede another) could convey erysipelas alone; that (4) could produce its effects upon children vaccinated from several vaccinifers; while (5) it could affect one or two

only out of several children vaccinated from the same vaccinifer.

It is here that the detection made at the public inquiry of the repeated use of washed points comes to have its serious importance. Until this fact was elicited, there was no act or thing, having the same distribution as the cases of disease, that had been discovered. But now it is seen that septic matter may have been carried upon certain individual points and inserted unawares into the arms of certain individual children, producing erysipelas in those children and in no others. All that is required to account for occurrences that had previously been unintelligible is to believe that in the middle of the sitting on 13th June, a group of imperfectly cleaned ivory points came into use; that two of these were used to take lymph from Percy Armes, and were rubbed into the punctures on Threadkill and Tyler; that a third was used to take lymph from Lambert, and was rubbed into Lambert's arm; and a fourth to take lymph from Wicks to Girling, and was rubbed into the punctures on Girling's arm. This is literally all that is needful to account for the whole of the peculiarly obscure occurrences of 13th June.

The inspectors in their joint report, after recognising the importance of their new observation, go on to give reasons why they do not think the children of 13th June got their erysipelas in this way. But, in their reasons, they appear to overlook the consideration which forms the principal ground on which the agency of transfer points claims to be regarded, viz., the independence of each single ivory point, its separate use, and its separate liability to be harmless or harmful. Their difficulties pass away with a little reflection.

1. They do not see how the child Percy Armes, who supplied lymph for the vaccination of four children, could himself have escaped injury from infective points applied so many times to his opened vesicles, while two out of the four children vaccinated with those points caught malignant erysipelas. The lymph of the child Armes, however, was a feeble lymph, failing to produce vaccinia in three out of the four children vaccinated with it; and feeble lymph is habitually copious. The taking of amply flowing lymph on two infected points is hardly likely to have been of any harm to the vaccinifer, though it injured the two children who had the points rubbed into the punctures or scratches on their arms.
2. The inspectors do not see how it could happen that the child Lambert should be infected in the act of taking its lymph, while the child Johnson vaccinated from it escaped. There is discrepancy about the statement of the number of children vaccinated from Lambert. The mother says three, the register says one. Perhaps points were charged, as well as Johnson vaccinated; but the fact does not seem to have been ascertained. A clean point used to transfer lymph from Lambert to Johnson would not have given erysipelas to either of them. But an infective point afterwards used to take lymph from Lambert for the purpose of storage or of use elsewhere, and applied to Lambert's vesicles of no remarkable yield, might readily have injured Lambert. Inquiry does not appear to have been made about the subsequent use of any lymph taken from Lambert after the vaccination of Johnson, and the facts are important to be known.
3. The inspectors do not see how it could happen that Girling should be infected, while Wicks, the vaccinifer, escaped. So far as the escape of the vaccinifer is concerned, the case of Wicks resembles that of Armes. An infective particle upon a point used in the transfer of lymph may find its opportunity of mischief on the one or other child, though the vaccinifer must needs incur less risk than the vaccinee, into whose punctures the infective point is deliberately rubbed to get off adherent material.

The reasons alleged by Mr. Henley and Dr. Airy for not regarding the ivory points as the probable cause of mischief would have application enough if one were to consider each ivory point as just the same with its fellow in its qualities and in its mode of use. But it is the very liability (incidental to the repeated use of points) of one point to differ from another in essential conditions that allows the employment of particular points to have been parallel to the occurrence of particular erysipelas. In the present case the two things



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have been parallel in a way that no other things are parallel.\*

I do not profess to indicate the whole of the directions which might have been taken by inquiry proceeding, as I should have wished it to do, upon the recognition of Dr. Guy's practice of using old points; but I am sure it would have been well, among other things that might have been more difficult, to impound every ivory point in Dr. Guy's possession, and to examine each one of them (with distinction of what he indicated as having once been used) for evidence of that cleansing which he said he always gave to points after using, and for traces of foreign matter remaining on the surface of any point, and to put any such foreign matter to chemical and microscopical test. Of course it would not have been possible to recover particular points as they were used in the vaccination of particular children on 13th June, yet there would have been, none the less, a significance in knowing the ordinary condition of points as employed by Dr. Guy and in examining the evidences of his habitual care. Dr. Airy, however, did not succeed in ascertaining the fact of points being used until the public inquiry, and it would seem that that inquiry has superseded the ordinary methods of investigation of the medical department. Dr. Airy was then concerned with Mr. Henley in investigating a "complaint," and he did not return to study of the means by which the children may have got their erysipelas.

I may usefully add to this Memorandum what I know concerning the liability of points, used as Dr. Guy uses them, to retain foreign matters at their ends. Taking ivory points charged with a minute quantity of a chemical substance (choosing one that is easy of recognition and that does not act on the ivory) to represent a chance foreign material remaining upon the point in practice, I observe one kind of ivory to differ much from another in the facility with which the sub-

\* To one coincidence indeed the inspectors do direct attention. They show that Percy Armes, who supplied lymph for the vaccination of Threadkill and Tyler who got erysipelas, and of Harvey and Coan who got no erysipelas (Harvey had some eczema in the second week), had not the common potency of vaccine in his lymph, for it produced no vaccine vesicles on Tyler, Harvey, and Coan. It is undoubtedly one coincidence worth observing, for the practice of the Norwich Station shows but rarely instances of failure. And it is indeed worth further examination with reference to the considerations of the text. Feeble lymph is often of peculiar physical characters, such as would be expected to affect the facility with which it could remove matter adherent to an ivory point. But for the rest there is little suggestive in the coincidence between failure and a case of erysipelas. Of the four to whom Armes supplied lymph, the one whose vaccination was successful suffered under disease; two of the three whose vaccination failed did not suffer under it. Then two other children who did get erysipelas on the same occasion had nothing whatever to do with Armes. Armes himself was affected by nothing but regular vaccine at any time. The problem requires something that children vaccinated from Armes had in common with a child vaccinated from Wicks, and having nothing to do with Armes; and in common also with a child who furnished lymph to another, and who also had nothing to do with Armes. The state of Armes personally can have had nothing to do with these other cases.

stance can be removed by dissolving and wiping, and that one differs much from the other in the facility with which solid particles can be removed from the surface by rubbing or scraping.

Hence, in the case of a point which has been used in vaccination, the removal of the last trace of animal matter is probably not an easy business. Imperfect removal of such matter must needs, unless attention is specially paid to dryness, result in the decomposition of it, and that decomposition will produce a putrid material capable of producing disease in a child who has the point moistened (with vaccine or anything else) and rubbed into its arm.

Having this experience of the difficulty of completely removing all foreign matter from an ivory point, I further think it right to record what I know of Dr. Guy's habits of care over matters of the sort. At inspection of his vaccination work in 1876, it was found to be good in some respects, but Dr. Airy did not recommend him for award, owing to his use of dirty instruments in the processes of vaccination. Dr. Airy did not recommend him at the 1878 inspection, by reason of slovenliness in the selection of lymph. Then I find that Dr. Guy at the 1880 inspection, deferring to Dr. Airy's representations and operating in Dr. Airy's presence, avoided the use of any points in the transfer of lymph, and that he has subsequently resumed the practice, employing the same point over and over again. I find him, in view of his ostensible amendment, and on the strength of his vaccine scars being of good quality, of the kind that indicate good protection against small-pox, recommended for award from the Parliamentary Grant. But when after this it occurred to the National Vaccine Establishment, in the hope of amplifying their customary store, to invite from Dr. Guy specimens of his lymph, a great majority of his tubes were found to contain blood, and were not sealed; the liquid contained in one tube was not coagulated by heat. The establishment of course declined any dealing with Dr. Guy, and put Dr. Airy in possession of the facts, in preparation for his next inspection of Dr. Guy's station.

I must not allow this Memorandum to close without a suggestion for practical use arising out of the considerations submitted in it. The present instructions to vaccinators under contract direct that if lymph be stored on points, the lymph should be kept dry, the points being constantly well protected from damp, and the instructions further enjoin upon contractors to keep in good condition the instruments which they use in vaccinating. But I propose to add the specific instruction, "Never use an ivory point a second time, either for the conveyance or for the storage of lymph."

(Signed) GEORGE BUCHANAN.

4 November 1882.

(See Questions 15,291-303 and 15,327-36.)

#### REPORT TO THE LOCAL GOVERNMENT BOARD BY DR. F. W. BARRY ON A DEATH ALLEGED TO HAVE BEEN CAUSED BY VACCINATION IN THE NORTHERN DISTRICT OF THE DERBY UNION.

[1]

In consequence of local information of the occurrence of a death which was alleged to have been caused by vaccination at Derby, I was directed by the Board on November 17th to institute an inquiry into the circumstances of the case.

I accordingly proceeded to Derby, and at once placed myself in communication with Mr. Legge, the public vaccinator of the district in which the case had occurred, and obtained from him his vaccination register containing the particulars of the case in question. I also took possession of the lancet with which he was in the habit of performing his public vaccinations, and a needle with which he opened the vesicles on the eighth day.

The case to which attention was drawn was that of a child named Edith Chalkley, of 3, West Row, Darley, who was vaccinated by Mr. Legge on the 13th September, inspected on the 20th September, and who died on the 13th November, the cause of death being certified by Mr. A. O. Francis, M.R.C.S., as from "Abscesses (two months), Exhaustion."

The following is a brief history of the case, as obtained from the mother:—

The child, who was then three months of age, was taken to the vaccination station in Lodge Lane, Derby, on the 13th September, and was there vaccinated by Mr. Legge on the left arm in three places. The vaccination went on all right in two places, but the third

did not seem to come forward properly. The child was again taken to the station on the following Wednesday (September 20th) for inspection, and Mr. Legge then opened the places with a needle and took matter (lymph) from two of the places (vesicles). He did not ask any questions or examine the child's person prior to taking the matter.

There was at the time little or no redness about the place where the child was vaccinated, but two days afterwards (22nd September) a rash (red pimples and wheals) came out over its body, and the left arm inflamed from the elbow to the wrist and became hard and painful. During the same week a lump began to form in the left armpit, which gradually increased to the size of a duck's egg, and eventually burst, discharging a quantity of matter. On the 29th September, abscesses began to form on both sides of the neck, and these eventually broke and discharged. About the beginning of October, she noticed the inflammation spreading across the back to the right arm. This was succeeded by a swelling under the right armpit, and at the right elbow, and by the end of the first week of that month (October) the latter swelling broke and continued to discharge matter until the 30th October, when a piece of gristle was expelled. The abscess under the right armpit also broke and the child died from exhaustion on the 13th November, exactly two months



from the date of vaccination. At the time of her death lumps, which were apparently abscesses in process of formation, also existed in the back and groins. The vaccination places had in the meantime dried up.

Mrs. Chalkley further stated that both she and her husband had always enjoyed good health, that she had had two other children, one of whom had died soon after its premature birth at eight months, the other was still living, had been successfully vaccinated, and was to all appearance a healthy child. The deceased was treated from the commencement of her illness by Mr. A. O. Francis, M.R.C.S., at his dispensary in Derby.

Mr. Francis was unfortunately not able to give me very much additional information, as owing to the fact of its being a dispensary case, he had not kept an account of the visits or treatment. He stated that he treated the child for abscesses in the axilla, neck, and right elbow; that so far as his memory served him, there was no erysipelas, when the child was first brought to him, but that he did not make a full and particular examination. He did not consider that the child was suffering from syphilis; he did not see it after 6th November. The child was clean and well cared for.

I may as well state here that the house was in fair sanitary condition, no drain inlets being apparently situated in it, whilst the privy was at a considerable distance from the house.

The above imperfect account gives all the information that I was able to obtain with regard to the history of Edith Chalkley's illness, yet imperfect as it is, the symptoms were apparently those one would expect to find in a case of septic infection, resulting either from an inoculation with active septic material, or with the infective products of inflammation.

Taking this hypothesis, the question next arose as to whether, either at the time of vaccination or of inspection, there was any possibility of the transmission or inoculation of such septic material, and to ascertain this I deemed it necessary, firstly to enquire into the history of all the children who had been at the station on the 13th and 20th of September, these being the days on which Edith Chalkley attended. This of course included such cases as had been vaccinated on the 6th, they having attended for inspection on the 13th, and some of them naturally having acted as vaccinifers to the children then operated upon. Secondly I examined minutely into all the circumstances connected with the performance of the operation itself by the public vaccinator, to ascertain whether the untoward results might be traced to any careless or accidental inoculation with septic matter.

(A.) The total number of children into whose history I found it necessary to inquire was thirty. Of these, seven were vaccinated on the 6th, 13 on the 13th, and 10 on the 20th. A copy of the public vaccinator's register with reference to these cases is appended. [See page .]

In the following table is shown the derivation of the lymph supply, as ascertained from the above-noted register, of all the cases vaccinated on the 13th and 20th September.

TABLE showing lymph derivation of cases vaccinated at Derby on the 13th and 20th September 1882.

| September 6th.     | September 13th.                                                                        | September 20th.                                                                                         |
|--------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| (a.) Harratt (223) | { Bladon (235).<br>Sims (236).<br>Bretnor (237).                                       | —<br>—<br>—                                                                                             |
| (b.) Randle (224). | —                                                                                      | —                                                                                                       |
| (c.) Randle (225). | —                                                                                      | —                                                                                                       |
| (d.) Hook (226)    | { Hartle (241) (see text)<br>Brown (242) (see text)                                    | —<br>—                                                                                                  |
| (e.) Watts (227)   | { Swan (238) - -<br>Parker (239) - -<br>Chalkley (240).                                | { Lapworth (251).<br>Tarr (252).<br>Wood (243).<br>Tomlinson (244).<br>Southall (245).<br>Curtis (246). |
| (f.) Ogden (228).  | —                                                                                      | —                                                                                                       |
| (g.) Smedley (229) | { Baggellay (231)<br>Smith (230).<br>Sprentall (232).<br>Folder (233).<br>Smith (234). | { Ollernshaw (247).<br>Topham (248).<br>Taylor (249).<br>Haies (250).<br>—<br>—<br>—                    |

The figures in brackets refer to the numbers in the public vaccinator's register.

As a matter of convenience I propose to deal with each case that was vaccinated on September 6th, in the order in which it stands in the register, and in cases where these have acted as vaccinifers, I shall give at the same time the history of their derivatives.

(a.) *Harratt, Florence C.*, aged 5 months. Vaccinated September 6th. Inspected\* 13th September. Vaccination took ordinary course. No untoward result.

*Bladon, Fanny D.*, aged 5 months. Vaccinated September 13th from Harratt. Inspected 20th. After the inspection the arm became inflamed to a slight extent. This, however, was at once subdued by the application of bread poultices. No untoward results.

*Sims, Annie*, aged 3 months. Vaccinated 13th September from Harratt. Inspected 20th. Vaccination normal.

*Bretnor, Grace*, aged 2 months. Vaccinated 13th September from Harratt. Inspected 20th. Vaccination normal.

(b.) *Randle, Ellen*, aged 3 months. Vaccinated 6th September. This child never came for inspection. Her parents were stated to have made a "moon-light flit," and no traces of them could be found.

(c.) *Randle, Harriet*, aged 4 months. Vaccinated 6th September. Inspected 13th. The vaccination in this case was stated to have taken a normal course.

(d.) *Hook, Mary Ellen*, aged 2 months. Vaccinated September 6th. This child was never inspected by the public vaccinator, having been taken ill with bronchitis immediately after the operation was performed. The mother called in Mr. Rice, M.R.C.S., and he directed her not to take the child to the station, but to go there herself and say that the operation had been successful. I must here note a serious error in the public vaccinator's register, where the child appears as having been inspected at the station on the 13th, and to have further acted as vaccinifer to cases 241 and 242, which was manifestly impossible. Such entries as these naturally render the register untrustworthy, and throw a doubt on the derivation of lymph in other cases.

*Hartle, Alice*, aged 3 months. Vaccinated 13th September. Vaccinifer unknown, probably Watts. Inspected 20th. The mother states that the child was vaccinated in three places, only one of which took. The case went on well until two days after inspection, when the arm began to swell, and became red and hard. Eventually two blisters formed on the back of the hand, which burst after the application of poultices, and the child is now well. No lymph was taken from this child on the 20th, in fact, Mr. Legge is stated never to have touched it on that day. This case was attended professionally by Dr. Stanley Taylor, from whom I ascertained the following particulars:—He said that he first saw the child on the 22nd September at the house of a Mrs. Gleeson, whom he had been attending for some days for severe facial erysipelas. The child at that time was suffering from a slight attack of the same disease. There was no doubt that Mrs. Hartle with the child was continually in Mrs. Gleeson's house during her illness, she being a very near neighbour, and there was thus ample opportunity for transmission of the disease from Mrs. Gleeson to the child, and there can be no doubt that the child's illness after its vaccination was due to this cause.

*Brown, Edith M.*, aged 3 months. Vaccinated September 13th. Vaccinifer unknown, probably Watts. Inspected 20th. Vaccination normal.

(e.) *Watts, William*, 5 months. Vaccinated 6th September. Inspected\* 13th September. This child is the one said to be the vaccinifer in Edith Chalkley's case. This is an extremely healthy and strong looking boy. The mother stated that the course of vaccination was quite normal; that the areola developed was slight, and that the scabs dropped off about the 28th day. There are at the present time, three well marked scars. The mother further said that neither she nor her husband had ever suffered from ill health, and that she had had twelve children, of whom nine are living. She also told me that the vesicles in this case were very plump, and Mr. Legge obtained a large supply of lymph from them.

*Swan, Henry*, aged 3 months. Vaccinated 13th September from Watts. Inspected\* 20th. Vaccination perfectly normal.



[4]

*Lapworth, Sarah Ellen*, aged 3 months. Vaccinated 20th September from Swan. Inspected\* 27th. Vaccination normal.

*Tarr, Arthur C. E.*, aged 2 years. Vaccinated 20th September from Swan. Inspected\* 27th. The mother stated the child suffered from a rash about a month after vaccination, for which she blamed the operation, and that since then he had become very weakly and had had lumps in different parts of his body. In consequence of its condition, Mr. Legge (her medical attendant) had procured its admission into the Children's Hospital, where it was at the time of my visit. Upon inquiring of Mr. Legge the nature of the child's illness, he informed me that when he was first called in it was suffering from chicken-pox, which was succeeded by erythema nodosum, and this he attributed to poor and insufficient feeding. I may here state that Mrs. Tarr, who has recently become a widow, told me that owing to her reduced circumstances she had not been able to give her children enough food. I saw the child at the hospital and found it to be suffering from what was apparently well marked erythema nodosum, a disease in no way attributable to vaccination.

*Parker, William John*, aged 2 months. Vaccinated 13th September from Watts. Inspected\* 20th. Vaccination normal.

*Wood, Selina*, aged 3 months. Vaccinated 20th September from Parker. Inspected\* 27th. Vaccination normal.

*Tomlinson, Harry*, aged 5 months. Vaccinated 20th September from Parker. Inspected\* 27th. Results normal.

*Southall, William*, aged 3 months. Vaccinated 20th September from Parker. Inspected 27th. Results normal.

*Curtis, Norman*, aged 3 months. Vaccinated 20th September from Parker. Inspected 27th. Unsuccessful. This child has since been successfully vaccinated.

*Chalkley, Edith*. The history of this case, which was vaccinated from Watts, has already been given at length.

(f.) *Ogden, Harriet*, aged 3 months. Vaccinated 6th and inspected 13th September. Vaccination normal.

(g.) *Smedley, Mabel M.*, aged 2 months. Vaccinated September 6th, inspected\* 13th September. Results normal.

*Baggellay, James*, aged 4 months. Vaccinated September 13th from Smedley. Inspected\* 20th. Results normal.

*Ollernshaw, Ernest*, aged 3 months. Vaccinated 20th September from Baggellay. Inspected 27th. Results normal.

*Topham, Martha Alice*, aged 4 months. Vaccinated 20th September from Baggellay. Inspected 27th. Father states that vaccination took well, and ran through its normal course without ill effects. The child, however, was taken ill about the beginning of October and died on the 1st November, death being certified by Mr. G. Rice, M.R.C.S., as from "Marasmus." The disease had no connexion with vaccination.

*Taylor, Sarah A.*, aged 5 months. Vaccinated September 20th from Baggellay. Inspected 27th. Results normal.

*Hales, Frances*, aged 3 months. Vaccinated 20th September from Baggellay. Inspected 27th. This child left the town, and no information could be obtained regarding it.

*Smith, Sarah*, aged 2 months. Vaccinated September 13th from Smedley. Inspected 20th. Results normal.

*Sprenthall, Agnes B.*, aged 8 months. Vaccinated 13th September from Smedley. Inspected 20th. Results normal.

*Folger, Alfred*, aged 3 months. Vaccinated 13th September from Smedley. Inspected 20th. Results normal.

*Smith, Catherine*, aged 5 months. Vaccinated 13th September from Smedley. Inspected 20th. Results normal.

*Note.*—In the cases marked with an asterisk (all of whom were employed as vaccinifers by Mr. Legge) the parents stated that the public vaccinator took lymph from the vesicles on the eighth day, but that in no case were any questions asked with regard to the health of the child or its parents, nor was any examination made of the child's person.

From the above notes it will be seen that of the 30 cases with regard to which inquiries were made in 25 the results of the vaccination were perfectly normal, and that of these one subsequently died of a disease unconnected with vaccination. Of the remaining five, the operation was unsuccessful in one case, two had removed out of the district and could not be traced, one was the case with regard to which this inquiry was directed, and the last suffered from erysipelas, which, from the history of the case, was doubtless due to direct contagion from a previous idiopathic case of that disease.

(B.) With regard to the performance of the operation by the public vaccinator. Mr. William Legge, M.R.C.S. and L.S.A., was appointed public vaccinator for the north district of the Derby Union on the 24th August of the present year. He does not hold a certificate of proficiency in vaccination, such certificate not being requisite in the case of practitioners registered before 1st January 1860, and Mr. Legge was registered on 1st January 1859. In accordance with this contract he attends at the Wesleyan School-room in Lodge Lane every Wednesday from 2 to 3 p.m. I had an opportunity of personally inspecting his mode of work on the 22nd of November, and, as this is peculiar, I will proceed to describe it.

The instruments ordinarily used by this gentleman for the transfer of lymph from child to child consist of (a) an ordinary lancet; (b) a needle fixed in a handle; (c) capillary tubes; (d) small squares of glass. Having selected a vaccinifer, Mr. Legge opens the vesicles with the needle, and then collects the lymph in capillary tubes; these are placed on the table unsealed, and as each child comes up for vaccination the contents of one of the tubes is blown on to one of the small squares of glass, the lymph is taken from the glass square by means of the lancet, and the vaccination is then performed by scratching the child's arm with the charged lancet.

Mr. Legge stated that he used the capillary tubes over and over again, although not knowingly at the same sitting, and he says that he always submits them to a careful cleansing with water before using them a second time.

On the date of my inspection the vesicles were opened with a lancet, as I had forwarded the needle to London for examination.

Mr. Legge further stated that up to the beginning of November, he was in the habit of blowing the contents of the tubes directly on to the lancet with which he operated, without the intervention of the square of glass.

If all the lymph so collected is not required, the tubes are sealed up and reserved either for future use at the station or for transmission to other practitioners.

I obtained some of the tubes which had been charged on the 8th November and reserved them for future examination, and to them I shall again have occasion to refer. I also took possession of such capillary tubes as were used for taking the lymph on the 22nd inst., before, however, they had been submitted to any cleansing process.

The course of procedure above described, even if it were carried out with the greatest possible care, and with the most scrupulous attention to the cleanliness of each unit of the complicated apparatus used, undoubtedly affords peculiar facilities for the contamination of the lymph by foreign matter, and without having, as far as I can see, any advantage over the ordinary method.

The lancet and needle ordinarily used, and the above-mentioned charged and uncharged capillary tubes were submitted to Mr. Farn, of the National Vaccine Establishment for examination on the 23rd inst., and on the 24th November he reported as follows:—

"The lancet is found to be without a point, rusty and dirty; the vesicle-opener also rusty and dirty."

"The fine tubes which profess to be uncharged (and concerning which the statement is made that they, or some of them, have been used for taking lymph but have not been since cleansed) are found to be empty and clean, with the exception of one, which contains some albuminous matter coating its interior."

"Along with them was a charged tube, of which the ends had been melted but not sealed, and from which the greater part of the contents had escaped, dirtying the exterior of the empty tubes."

"Two tubes marked as charged from 317 contained each a small quantity of opaque lymph, one also a little blood. They were sealed. Two tubes marked

[5]



as charged from 318 contained each a small quantity of opaque lymph, slightly bloody, and were not sealed. Another tube containing lymph, of which the source was not recorded, contained a small quantity of opaque lymph and was not sealed."

If the instruments were habitually in the condition described above, the possibilities of the inoculation of septic matter at both the periods of vaccination and of opening the vesicles, are endless.

The repeated use of the same capillary tubes is also a most dangerous practice, as it is extremely doubtful whether it is possible to cleanse such tubes effectually after they have been once used.

I have already pointed out the non-observance by the public vaccinator of the instructions with regard to the examination of both vaccinifers and vaccinees, and to this I must add that Mr. Legge disobeys the instructions laid down for public vaccinators by a habit that he has of vaccinating children who are suffering from eczema, in the hope of curing the eczema.

On the date of my visit to the station five children appeared for inspection and some seven or eight for vaccination. As, however, the vesicles in three of the five cases were surrounded with a slight areola, I suggested that those children should not be used as vaccinifers, and that Mr. Legge should obtain a fresh strain of lymph from the National Vaccine Establishment. I directed Mr. Legge in future to carry out strictly the instructions of the Board dated 29th July 1871, and also to vaccinate directly from arm to arm.

In conclusion I have the honour to submit the following summary of the principal facts noted respecting

the child Edith Chalkley, and the conclusions arrived at from the inquiry.

1. That from the history of the case of the child Edith Chalkley there is a strong probability that she suffered from septic disease.
2. That the disease was probably communicated to her at or about the period of inspection.
3. That it is quite certain that the lymph furnished by Watts did not convey any septic infection, and that there is nothing to suggest that other lymph in use at this time conveyed any such infection.
4. That Mr. Legge's method of transferring lymph by the needless intervention of tubes and glasses, his use of dirty instruments, his practice of using the same capillary tube again and again, and his habit of storing lymph in unsealed tubes, afford numerous opportunities for the introduction of septic matter into vaccinifers, and into children presented for vaccination. There is no direct evidence of the way in which septic infection was communicated to the child Chalkley, but there can be very little doubt that it was inoculated into that particular child from some dirty appliance used by Mr. Legge.
5. That the public vaccinator has rendered himself liable to grave censure for the erroneous entries in his register, and for his manifold disobediences to the Board's instructions of 29th July 1871.

FRED. W. BARRY, M.D.

29th November 1882.

[See appendix to this report over page.]



EXTRACT from the PUBLIC VACCINATOR'S REGISTER of the NORTH DISTRICT of the DERBY UNION, giving Particulars as to CHILDREN vaccinated during September 1882.  
(Appendix to Dr. Barry's report, pages 484-8.)

| 1.<br>No. of Case consecutive to 500, and then to be repeated. | 2.<br>Date of Vaccination, | 3.<br>Name.           | 4.<br>Age. |         | 5.<br>In case of Re-vaccination of Adults, and Adolescents successfully vaccinated in early life mark R. | 6.<br>Place of Residence.     | 7.<br>Where Vaccinated.* | 8.<br>Name or No. in Register of the subject with whose Lymph the Vaccination is performed, or sent by the National Vaccine Establishment, or state other source, if any. | 9.<br>Initials of person performing the Vaccination. | 10.<br>When and where inspected.* |                                 | 11.<br>Initials of the Person inspecting. | 12.<br>Result. |               | 13.<br>Date of sending Certificate to the Vaccination Officer. | 14.<br>Fee due in respect of each Case of successful Vaccination. | 15.<br>Fee due in respect of each Case of successful Re-vaccination. |
|----------------------------------------------------------------|----------------------------|-----------------------|------------|---------|----------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------|---------------------------------|-------------------------------------------|----------------|---------------|----------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------|
|                                                                |                            |                       | Years.     | Months. |                                                                                                          |                               |                          |                                                                                                                                                                           |                                                      |                                   |                                 |                                           | Successful.    | Unsuccessful. |                                                                |                                                                   |                                                                      |
| 223                                                            | 1882.<br>Sept. 6           | Harratt, Florence C.  | -          | -       | -                                                                                                        | Pegg's Yard, Friar Gate       | Station                  | 213                                                                                                                                                                       | W.L.                                                 | Station.                          | 1882.<br>Sept. 13<br>Gone away. | W.L.                                      | S.             | -             | September 13                                                   | 1 6                                                               | -                                                                    |
| 224                                                            | "                          | Randle, Ellen         | -          | -       | -                                                                                                        | 1, 3 Ct. Rich Street          | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | W.L.                                      | S.             | -             | "                                                              | 1 6                                                               | -                                                                    |
| 225                                                            | "                          | Randle, Harriett      | -          | -       | -                                                                                                        | 35, Green Street              | "                        | 210                                                                                                                                                                       | "                                                    | Station.                          | Sept. 13                        | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 226                                                            | "                          | Hook, Mary Ellen      | -          | -       | -                                                                                                        | 29, Back Parker Street        | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 227                                                            | "                          | Watts, William        | -          | -       | -                                                                                                        | 111, Cobden Street            | "                        | 222                                                                                                                                                                       | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 228                                                            | "                          | Ogden, Harriett       | -          | -       | -                                                                                                        | 34, Gisborne Street           | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 229                                                            | "                          | Snedley, Mabel M.     | -          | -       | -                                                                                                        | Peel Street                   | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 230                                                            | Sept. 13                   | Smith, Sarah          | -          | -       | -                                                                                                        | 67, Willow Row                | "                        | 229                                                                                                                                                                       | "                                                    | "                                 | Sept. 20                        | "                                         | "              | -             | September 20                                                   | 1 6                                                               | -                                                                    |
| 231                                                            | "                          | Beggaley, James       | -          | -       | -                                                                                                        | Wide Yard, Bridge Street      | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 232                                                            | "                          | Sprethall, Agnes B.   | -          | -       | -                                                                                                        | 37, Shaw Street               | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 233                                                            | "                          | Folger, Alfred        | -          | -       | -                                                                                                        | 90, Whitecross Street         | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 234                                                            | "                          | Smith, Catherine      | -          | -       | -                                                                                                        | Ct., 6, Willow Row            | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 235                                                            | "                          | Bladen, Fanny O.      | -          | -       | -                                                                                                        | 93, Watson Street             | "                        | 223                                                                                                                                                                       | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 236                                                            | "                          | Sims, Annie           | -          | -       | -                                                                                                        | 6, Wright Street              | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 237                                                            | "                          | Bretnor, Grace        | -          | -       | -                                                                                                        | 15, Henry Street              | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 238                                                            | "                          | Swan, Henry           | -          | -       | -                                                                                                        | 31, New Chester               | "                        | 227                                                                                                                                                                       | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 239                                                            | "                          | Parker, Wm. Jno.      | -          | -       | -                                                                                                        | 78, Upper Brook Street        | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 240                                                            | "                          | Chalkley, Edith       | -          | -       | -                                                                                                        | 4, West Row, Darley           | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 241                                                            | "                          | Hartle, Alice         | -          | -       | -                                                                                                        | 6, New Chester                | "                        | 226                                                                                                                                                                       | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 242                                                            | "                          | Brown, Edith M.       | -          | -       | -                                                                                                        | 3, West Row, Darley           | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 243                                                            | Sept. 20                   | Wood, Selina          | -          | -       | -                                                                                                        | 12, City Road                 | "                        | 239                                                                                                                                                                       | "                                                    | "                                 | Sept. 27                        | "                                         | "              | -             | September 27                                                   | 1 6                                                               | -                                                                    |
| 244                                                            | "                          | Tomlinson, Harry      | -          | -       | -                                                                                                        | 3, Kedleston Road             | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 245                                                            | "                          | Southall, William     | -          | -       | -                                                                                                        | 25, Upper Brook Street        | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 246                                                            | "                          | Curtis, Norman        | -          | -       | -                                                                                                        | 32, Ponsonby Terrace          | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 247                                                            | "                          | Ollerenshaw, Ernest   | -          | -       | -                                                                                                        | 6, Museum Road, L. Chester    | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | U              | -             | See No. 262                                                    | -                                                                 | -                                                                    |
| 248                                                            | "                          | Topham, Martha Alice  | -          | -       | -                                                                                                        | 4, Mid Brook Street           | "                        | 231                                                                                                                                                                       | "                                                    | "                                 | "                               | "                                         | "              | -             | September 27                                                   | 1 6                                                               | -                                                                    |
| 249                                                            | "                          | Taylor, Sarah A.      | -          | -       | -                                                                                                        | Clarence Road, Mansfield Road | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 250                                                            | "                          | Hayles, Frances       | -          | -       | -                                                                                                        | Flowerpot Yard, King Street   | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 251                                                            | "                          | Lapworth, Sarah Ellen | -          | -       | -                                                                                                        | 6, Little Chester             | "                        | 238                                                                                                                                                                       | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |
| 252                                                            | "                          | Tarr, Arthur C. Esq.  | -          | -       | -                                                                                                        | 41, Shaw Street               | "                        | "                                                                                                                                                                         | "                                                    | "                                 | "                               | "                                         | "              | -             | "                                                              | 1 6                                                               | -                                                                    |



(See Questions 14,149-215 and 15,337-9.)

App. No. 4.

## REPORT TO THE LOCAL GOVERNMENT BOARD BY DR. E. BALLARD ON AN INQUIRY INTO A FATAL CASE OF POST-VACCINAL ERYSIPELAS OCCURRING AT NEW HUMBERSTON (BILLESDON UNION).

This inquiry was made on November 28 and 29.

Constance May Wood, aged five months, residing at No. 24, Clara Cottages, Victoria Road, New Humberston, in the outskirts of Leicester, was vaccinated by the public vaccinator, whom I shall call Mr. N—, at the parents' residence (as above), at about 4 p.m. on Tuesday, September 25. This domiciliary vaccination was performed in compliance with the Board's Instruction to public vaccinators with a view to provide in this way for the due performance of arm-to-arm vaccination on the first day of the October periodical attendance. This first day was October 2, and the attendances were appointed at the public vaccination station in New Humberston. Mr. N— stated this to the mother of the child.

In pursuance of the inquiry, I obtained two separate statements, one from Mr. N— and the other from Mrs. Wood, the child's mother. It will be observed that in all material points of fact these two statements agree; each, however, being complementary to the other in respect of facts as to which only one of them could testify. After obtaining these statements I made inquiry into the condition of the premises and the various sanitary surroundings of the child.

1. Mr. N—'s account was as follows:—

On September 18, with a view to establish a stock of fresh lymph for his October vaccinations, he vaccinated at their homes in Old Humberston village four infants, with lymph purchased from Messrs. John Richardson and Co., of Leicester, who are agents for "The Association for the Supply of Pure Vaccine Lymph," the office of which is at 12, Pall Mall East, London. He states that he purchased the lymph in two tubes, one-third full, immediately before using it; so he had not kept it by him for any time. [I enclose for the Board's inspection two similar tubes\* subsequently purchased, which Mr. N— permitted me to impound, and also Mr. N—'s vaccination register, in which are entered the names of all children vaccinated, and the results of the operation.] Further, I enclose a circular of the "Association." It will be observed that to each tube sent out by the Association a register number is attached, the object of which (as stated in the circular) is, that the lymph "can at any time be traced to its source." Of the four children vaccinated at Old Humberston on September 18, one was vaccinated with "calf lymph" (procured, as stated in the circular, from Dr. Warlomont, of Brussels). This vaccination was unsuccessful. The other three were vaccinated with the humanised lymph of the Association. It is to be noted that in two of these cases the source of lymph is stated in Mr. N—'s register thus, "From Pure Vaccine Co., Tube 1," and in the third, "From Pure Vaccine Co., Tube 2." The reference numbers furnished by the Association are not entered, and Mr. N— was unable to tell me what the reference numbers were. On September 25, when he visited and inspected the three children vaccinated with humanised lymph, he found that the vesicles on one of them were broken and were so injured that they could not be used properly to furnish lymph; in another the development of the vesicles was from some cause so retarded and the vesicles so small ("size of large pin head") that he could obtain no lymph. The only child then available was Iva Elizabeth Wood, aged four months (no relation of Constance Wood). On the 25th (8th day) there was, Mr. N— says, an areola of  $\frac{1}{2}$  to  $\frac{3}{4}$  in. around each vesicle. From this child's arm he took lymph in a tube, sealed the tube, and went straight away to New Humberston, where he vaccinated with it in two places (which is his customary mode of vaccination) the left arm of Constance May Wood. The tube he used for the purpose was a new one recently obtained from Messrs. Harrison. He says that the lymph was perfectly clear, the vesicles good and unbroken; the child was clean, and the premises and parents clean and tidy; such was the case, too, when I visited the house and saw the child Iva on November

29. Iva's vaccination is said to have proceeded normally after the 8th day. There is no evidence to the contrary. Two good scars were left upon the arm.

He says that he visited the child Constance Wood on October 1, not because he was sent for, since he received no message, but because he knew the parents, who were customarily dispensary patients of his, and he was desirous of ascertaining whether the child would be available for the supply of lymph the next day. He found the sleeve of the child's frock carefully tied up so as not to touch the pocks, but both pocks were broken and lymph was trickling down the arm from them. There was then an areola of  $\frac{3}{4}$  in. round each vesicle, but there was no incrustation of dry lymph upon them. There was no further extended redness. The mother called his attention to what she considered a premature discharge of lymph, but made no complaint that the child was ill, and Mr. N— says that she looked well. He filled four tubes with this lymph, which he says looked clear, but he did not use them in any subsequent vaccination, but destroyed them about a week afterwards. On October 2 the child was brought, as directed, to the public vaccination station at New Humberston for the official inspection. Lymph was still running from the pocks, and he says that the areola had extended to  $1\frac{1}{2}$  in. around them. There was no incrustation. He directed the use of bread poultices. Some days later (he cannot tell which day) he was asked to see the child, and then found that after using the poultices, oxide of zinc (or zinc ointment which is made with it) had been applied, and that there was a hard crust of this substance over the vesicles. At that time he found that the redness had extended and reached the elbow, and that the child was really ill. He gave tincture of iron, and directed the incrustation to be got off by poulticing, and further directed the application of a lotion of Condy's solution. On the next day when he saw the child the incrustation was partly separated and had left a sore, which he says was healthy looking. He continued his attendance; the redness (now distinctly erysipelatous) extended subsequently to the fingers, then appeared on the other arm and on the legs, reaching to the feet; and there were similar patches in various parts of the trunk. A solid œdema occurred of both hands and feet, and later still some scabs (whether or not the result of the formation of bullæ I could not ascertain) were seen upon the scalp. Later on, and about 10 days before death, abscesses formed near each elbow and back. He describes it as "a diffused sort of suppuration." Nothing was discharged from them. The child died on November 19. I append the certificate of cause of death given by Mr. N—. It states that he had seen the child last on November 15, and that the cause of death was "diffuse cellulitis." I told him he should have mentioned the previous vaccination in his certificate. [3]

Mr. N— stated, in reply to some further inquiries, that at no time since he has been public vaccinator have the vesicles he has produced been free from areola on the eighth day; and that while habitually the areola has been to the extent of  $\frac{1}{2}$  to  $\frac{3}{4}$  in., sometimes it has extended to 1 inch from the vesicles. From what he told me I gathered that he considered an areola of  $\frac{1}{2}$  to  $\frac{3}{4}$  in. a normal and proper condition of a vesicle on the eighth day. He had not noticed the Board's Instruction prohibiting the use of lymph from areolated vesicles.

I saw his certificate of instruction in vaccination; it was dated June 28, 1883, and signed by Mr. Pearce, who was then officiating for Dr. Cory at Surrey Chapel.

2. Mrs. Wood's account:—

She says that when she went to bed on September 25, she noticed that there was some redness of the scratched surface, and that there was round each scratched surface a rim of redness, the width of which she represented to me on paper. It was about  $\frac{1}{16}$  in. She says that the redness increased daily as the pocks rose; they had obviously risen a little on the second day. The child, being suckled, slept by her side in the same bed with herself and her husband. On Sunday morning, September 30, she found that the vesicles were broken, and that fluid was running from them, but the child's

\* These two tubes have been forwarded unopened to Dr. Klein, who reports of their contents that they are wanting in the cultural characters of vaccine lymph. Of course, this fact cannot be connected with the particular occurrences recorded by Dr. Ballard.—G.B.



App. No. 4.

nightgown sleeve had not stuck to the broken pocks. At that time there was a slightly elevated areola of about  $\frac{1}{4}$  in. in width. Up to this time the mother says that she had applied nothing to the arm, but had kept the pocks bare during the daytime, covering the arm with the flap of a handkerchief tied round the neck. On this Sunday she expected Mr. N— to call, but he did not call until the Monday, October 1, on which day she says that she had sent a message to the station to the effect that, if he wanted to take lymph for use the next day (as he had told her he did), he must come as soon as possible or there would not be any for him. He came about 4 p.m. and took some of the lymph in tubes. He did not meddle with the pocks. At that time none of the discharge had dried upon the arm, and she says that the liquid that ran from the pocks and down the arm was clear. Her impression was that the vaccination had run an unusually rapid course. She took the child for inspection on October 2, on and after which day she poulticed the arm, and after about three days of this treatment applied zinc ointment, but not by Mr. N—'s direction. During this (the second) week the arm became worse, the spots ran together, and the discharge became thicker and more abundant. On the following Tuesday, October 9, she asked Mr. N— to come and see the child. [This was the day of visit that Mr. N— could not recollect.] The place was then encrusted with the oxide of zinc, and when this encrustation was removed by poulticing, a single large sore was found beneath it. After this Mrs. Wood's account corresponds in all respects with that of Mr. N—.

3. Condition of the premises and other surroundings of the child.

I proceeded next to inquire about the previous health of the other members of the family, and into the sanitary condition of the premises, and as soon as this part of the inquiry commenced Mrs. Wood became angry, answering my questions unwillingly, repeating that "nothing but the vaccination had anything to do with the child's illness," saying that it was "my interest to find some other cause for it," &c. I elicited from her, however, a statement that no member of the family had been ill in any way or had suffered from any surgical injury.

I inspected the house and back premises throughout. The house was not clean, although, according to Mr. N—, cleaner than it was during the child's illness. There are six more children in the family and the youngest, whom I saw, was dirty, and did not look as if it had been washed that morning. The house, a rough ground plan of which I append, contains two rooms and a scullery on the ground floor, two bedrooms on the first floor, and an attic bedroom in the roof. At the rear is a yard common to No. 24 and the adjoining house No. 22, between which houses is an arched entrance passage in which are the opposite entrance doors of the two houses. The scullery has a sink in it, the pipe from which discharges through a small square opening in the wall, over an iron (apparently well trapped) gully grating in the yard outside. The surface of the common yard of Nos. 22 and 24 is well paved between the sculleries of the two houses, and the rest of the surface of the yard was clean and free from accumulations. But along the yard wall on both sides was a caged run, occupied by a number of fowls, the floor of which run was encrusted, as is usual in such places, with trodden filth. The roosting place for the fowls adjoins the scullery. At the end of the yard, about 40 feet from the scullery door, which is the back entrance to the house, is the privy and ashpit of Nos. 22 and 24. The privy is an ordinary bricked pit-privy, and the excrement in it was on a level with the brick floor of the privy. The ashpit is covered, but open along all its yard front. It is sunk below the ground level, and contained a small deposit (some inches) of of liquid matters and decaying refuse. It had been emptied when quite full and very offensive a few weeks before my visit, and the residents at No. 22 complained to me of the offensiveness of the proceeding. It appears on inquiry that it is not the practice to empty these receptacles in New Humberston until they are thus full. Mrs. Wood complained of nothing, but the occupants of No. 22 complained not only of the offensiveness of the ashpit, especially when the sun lay upon it or the wind was in its direction, but also of habitual offensive smells from a piggery in the Overton Road, close at the rear of No. 24 and No. 26. In the common yard is a pump-well, little, if at all, used now, because a town water supply has been laid on, and there is a pipe with a tap from it affixed to the side of the pump. The Inspector of Nuisances, Mr. G. Harrison,

informs me that, although a drainage scheme for the place is now in progress, the whole of what is known as New Humberston is undrained, except where temporary inefficient provision has been made by means of cesspools, &c. I saw one of such cesspools with a broken cover, and much complained of, in a neighbouring front yard. But some little while ago a 6-inch socketed pipe was carried, as shown in the plan, from near the pump above mentioned along the passage between Nos. 22 and 24 to the pathway, beneath which it was carried 307 feet to a 2-feet 3-inch brick storm culvert in the Overton Road, and these premises, as well as about a dozen on either side of the way in Victoria Road, were connected with it. The drain and culvert are neither of them ventilated. This was a temporary arrangement, the Inspector says, for the relief of the premises pending the execution of the general drainage scheme. Towards the end of the month of October the cesspool into which the premises of Nos. 18 and 20, and the sinks in the sculleries of these houses, were drained, having become overfull and inefficient, and the drainage consequently obviously inefficient, producing offensive smells, the owner of the premises proceeded to connect the drains of Nos. 18 and 20 with the 6-inch pipe in the yard of Nos. 22 and 24, and for this purpose the drain in the common yard was opened; how long it remained open the person who executed the work could not tell me, but certainly not over one day.

When the streets of New Humberston (in the rural sanitary district of Billesdon) were constructed the roadways were not made or duly metalled, and consequently in many parts as the population grew and traffic took place through the streets they naturally fell into a filthy condition. Nothing can well be worse than the condition of the roadway in the Victoria Road, along the whole front of Clara Cottages, about the middle of which row of houses stands No. 24. It is deep in slush and filthy mud, impossible to be crossed by a foot passenger, and thoroughly cut up by the traffic that takes place along it. The footway also is scarcely passable from unevenness, sloppiness, and dirt. The Inspector of Nuisances says that this street especially has been for years in a most unwholesome condition for lack of adequate proper drainage, on account of its cesspools, &c. He says no one can wonder if the residents are of a dirty class when their surroundings are such as they are.

I visited the piggery complained of (the situation of which is marked F. in the plan); I found there a yard belonging to a greengrocer's shop in the Overton Road, and at the end of the yard a building (formerly I am informed partly used as a cow house) in which were a stable for one horse and some pigsties occupied by pigs. The sties were floored partially with brick in bad condition and wet with urine, &c., that partly stood on the surface and partly ran through to the surface outside the sties. In the yard were some small pools of black filthy liquid, and a heap of mixed horse and pig manure, with several tubs of pig wash in the usual decomposing condition. A few fowls and ducks were also kept here.

The surroundings of No. 24, therefore, were manifestly unwholesome. During the day the infant was habitually in the kitchen of the house, into which air was drawn by the fire most directly from the rear, where the air was most polluted by septic emanations.

In considering the bearing of all that has preceded in this report upon the illness of the vaccinated child, attention must first be given separately—*a*, to the vaccination; *b*, to the surroundings of the infant.

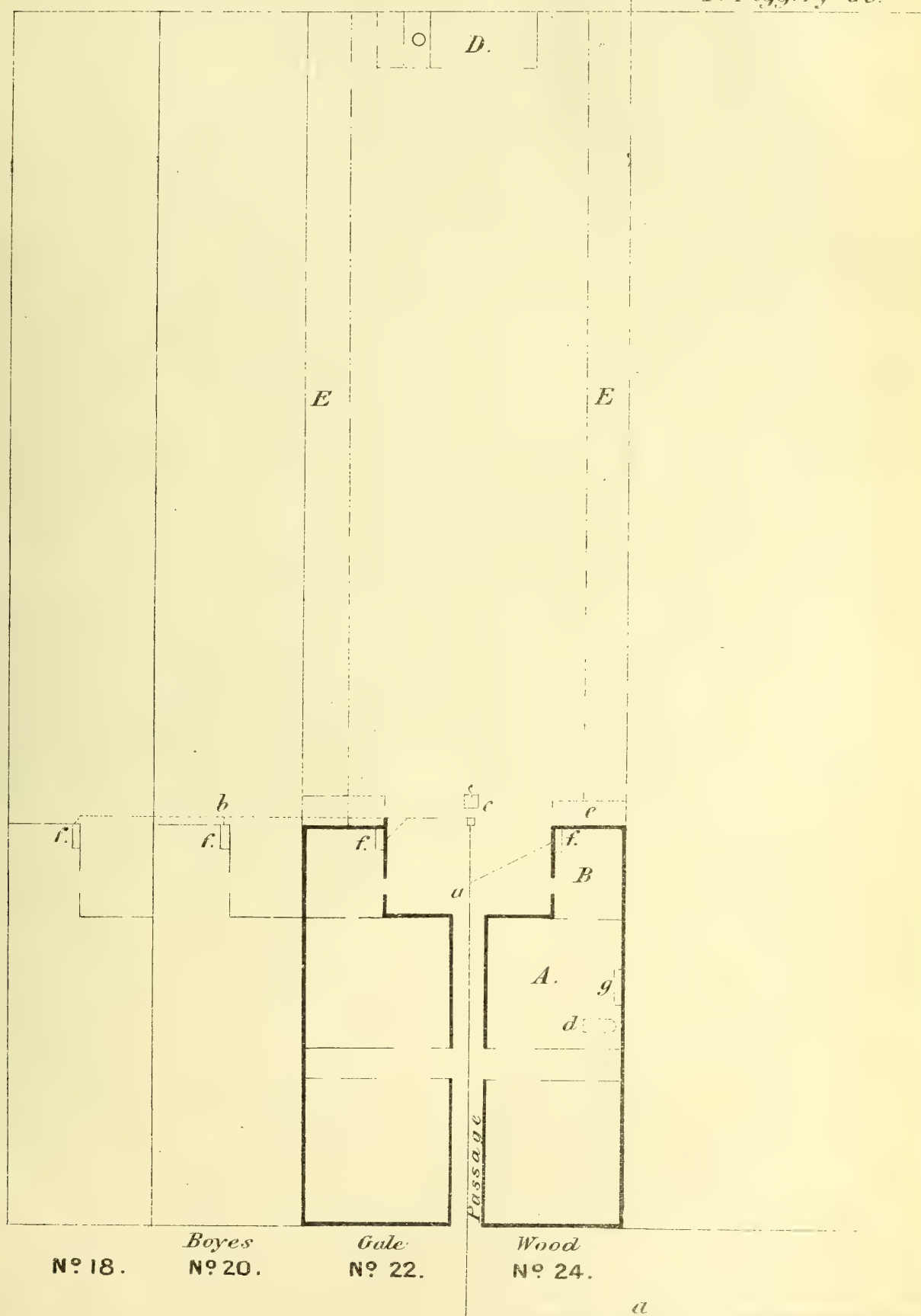
*a. As to the vaccination performed by Mr. N—.*—It does not appear that the lymph he used from Iva Wood contained the poison of erysipelas. I saw the lancet he used; it was, when I saw it, clean, sharp, and polished, as such an instrument should be, and he said that this was always its condition. Moreover, no mischief had happened in any of the other children whom he vaccinated at the end of September or during October. What happened in the case of Constance Wood was an unusually rapid, and so abnormal, development of pocks, which ought on the sixth day to have been firm enough to resist ordinary pressure, but which were in fact so loose and watery that they broke down under it while the child was in bed at night. Mr. N— might have suspected from the abnormal course of the vaccination in the other two children vaccinated on September 18 with "Association" tube lymph, and from the large areola about the pocks on Iva Wood, that the stock was of inferior quality, and have taken warning. In failing to do this he broke Instruction 8. And, in addition, he broke another of the Board's Instructions (Instruction 7)



# ROUGH GROUND PLAN OF "CLARA COTTAGES"

## NEW HUMBERSTON.

*F. Piggery &c.*



- A. Kitchen where Constance habitually lay in day time
- B. Scullery opening from kitchen and into yard -
- D. Privy and Ash pit.
- E. Covered cages for fowls.
- F. Piggery &c, mentioned in Report (a greengrocer in Overton Road.
- a. Pipe drain from pump running through passage between houses - unventilated.
- b. Drain that was newly made from adjoining houses in October.
- c. Pump.
- d. customary position of cradle
- f. sink.
- g. fireplace
- e. Fowls house for Roosting







in using lymph from a markedly areolated pock. But it appears from his statement to me that he habitually did this, and had no notion that such areolation on the eighth day was anything but proper. But the use of this inferior lymph was not the cause of the erysipelas, for from what we know of that disease in its connexion with vaccina, the erysipelas would have commenced much earlier than it did, and the course of the vaccine have been different from what it was. It is clear that, although there was present on the eighth day a considerably inflamed areola, which in the absence of unfavourable circumstances might have been reasonably expected under proper management to subside, there was no evidence of erysipelatous disease on that day. It was certainly present, however, on October 9; so that we may take it as certain that this disease had its commencement some time in the course of the second week of vaccination, probably towards the middle or latter end of the week. After that, the erysipelas followed the not unusual course of a severe case of that disease. The term "Diffuse Cellulitis" must be regarded as a euphemism. What relation then did the vaccination bear to the subsequent erysipelas? It was assuredly not the direct cause of it, as I have stated above; but resulting, as it and the treatment of the broken vesicles did, in the production of an open sore, the child was laid open to the introduction and operation of a direct and specific cause;—for it is to be understood that only a specific cause can produce a specific disease such as erysipelas. In fact, the erysipelas plainly was "traumatic," the open wound being the channel through which the contagium or specific cause obtained access to the system, just as it might have done in the case of any other wound (*e.g.*, after a circumcision or other surgical operation) productive of a raw or absorbing surface.

Mr. N—— further broke Instruction 6 in not keeping such a note of the supply of lymph obtained from the "Association" as would have enabled him to identify the origin of that which he used on September 18.

*b. As to the surroundings of the infant.*—These, as I have shown above in detail, were such as that no surgeon in his senses would willingly or except under urgent compulsion have performed in this place any serious operation productive of a wound, nor would any experienced surgeon have been surprised that an accidental wound or sore became attacked by erysipelas. It must be admitted that Mr. N——, in selecting Constance Wood for domiciliary vaccination with a view to obtaining lymph for arm-to-arm vaccination at his public station, knowing as he did all about the surroundings and all about the illness of a neighbour (to be mentioned presently), acted unwisely. The whole neighbourhood and the immediate vicinity of the kitchen in which the child habitually lay in the day time, and the atmosphere thus supplied to the room,

must have abounded in septic material, such material as the specific contagium of erysipelas is commonly associated with. All surgeons and hygienists well know of this connexion and take precautions accordingly. No surgeon and no hygienist could be surprised therefore on being told that under these surroundings an infant with an open sore on the arm became the subject of erysipelas. But, in addition to this general knowledge which Mr. N—— as a surgeon might have been expected to possess, he might have gathered caution from an experience in his own practice. On May 23 Mr. Gale, who with his family occupies No. 22, Clara Cottages, came under Mr. N——'s care, as district medical officer under the poor law, suffering from "boils," and was not well nor discharged from his list of poor-law patients until July 27. The entry against his name in Mr. N——'s medical relief book is "boils, blood poisoning." Mr. N—— told me, in addition, that he at that time attributed the illness to the surrounding insanitary conditions. On October 26, while Constance Wood was ill, Mr. Gale again became a patient of Mr. N——, this time for some sort of "gastric attack" (not, he says, "fever") with debility. At the time of my visit, a boy, son of Mr. Gale, and living with him at No. 22, had for a fortnight been ill with an abscess (not of a lymphatic gland) below the chin. Mr. N—— further told me that during last year he had attended full 100 cases of enteric fever in New Humberston, the result he believed of the unwholesome condition of the place arising from the deficient drainage of the locality.

That New Humberston generally and the Victoria Road and Clara Cottages particularly should have been in this unwholesome condition is assuredly the fault of the rural sanitary authority of Billesdon. Had the place been duly attended to by the authority, and had they taken care that it was reasonably wholesome, this fatal attack of erysipelas would in all probability never have happened, notwithstanding the abnormalities connected with the child's vaccination.

As respects any influence exerted by the opening of the head of the 6-inch pipe drain in the yard, looking at the fact that both the drains and the sewer which it enters are unventilated, there must at that time have been septic and dangerous exhalations from it, adding their morbid influence (to say the least) to that of the customary surroundings of the child.

This comment will enable the Board to assess with tolerable precision the kind and amount of blame imputable respectively to the public vaccinator, who was responsible for the operation, and to the local sanitary authority, who was responsible for the very unwholesome state of the locality in which the infant had to dwell while passing through her vaccinia.

EDWARD BALLARD.

December 4, 1888.



# INDEX TO MINUTES OF EVIDENCE AND APPENDICES.

[N.B.—In this Index the Figures refer to the Questions in the Evidence, unless they follow the letters "App.," when they refer to the pages in the Appendix.]

## ADAMS:

Adams's cases of small-pox inoculation referred to by Professor E. M. Crookshank, 10,434-7, 10,440, 11,140-50, 11,152-63, 11,170-6, 11,178, 11,241, 11,246, 11,253-62, 11,266-8, 11,273, 11,776, 11,839, 12,029, 12,062, 12,078, 12,080, 12,283.

## AIRY, MR. HUBERT, M.D.:

Report to the Local Government Board by Mr. J. J. Henley and Dr. H. Airy on certain deaths and injuries alleged to have been caused by vaccination at Norwich (21st October 1882), App. 478.

## ANDRÉ:

André's reported cases of inoculation for the cow-pox referred to by Professor E. M. Crookshank, 11,192.

## ANTHRAX:

Professor E. M. Crookshank's opinion as to protective inoculation for anthrax, 11,037-46, 11,209, 12,236, 12,258, 12,264, 12,280.

## AUSTRALIA:

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## BADCOCK, MR. JOHN:

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## BALL, MR. WILLIAM (analysis of his evidence):

Is a shoe-rivetter at Leicester, 14,086. Believes that the death of his brother was caused by vaccination, 14,087-96, 14,102, and mentions other cases where, in his opinion, illness was caused by vaccination, 14,103, 14,110-21. Has been fined, and imprisoned in default of payment, under the Vaccination Acts, 14,097-101, 14,104-6.

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## BALLARD, MR. EDWARD, M.D.:

Report to the Local Government Board by Dr. E. Ballard on an inquiry into a fatal case of post-vaccinal erysipelas occurring at New Humberston, Billesdon Union (4th December 1888), App. 489.

## BANBURY, MR. JOHN (analysis of his evidence):

Is a whitesmith at Leicester, 14,668. Is opposed to compulsory vaccination, and has been fined three times under the Vaccination Acts, once in respect of each of his children, 14,669-73. The case of his eldest daughter, a pupil-teacher under the Leicester School-board, in connexion with the regulation of the Education Department requiring a certificate of vaccination of pupil-teachers before engagement, 14,674-90.

## BARFOOT, MR. WILLIAM (analysis of his evidence):

Is a merchant at Leicester and a Justice of the Peace for the borough, has for many years been a member of the corporation; has been Mayor, and was for a time a member of the Board of Guardians, 13,423-7, 13,430; and has adjudicated upon many cases under the Vaccination Acts, 13,428-9, 13,431.

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## BARRY, MR. F. W., M.D.:

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## BEURLE, MR. WILLIAM LOUIS (analysis of his evidence):

Is a Guardian of the Hackney Union and a member of other public bodies, 12,421-4, 12,433; and Vice-president of the Hackney Anti-vaccination League, 12,427-8. Has devoted attention to questions connected with enforcing the vaccination laws and attended on many occasions summonses taken out against parents for breach of the Vaccination Acts, 12,425-6, 12,429-32, 12,434, 12,441-3, 12,469-78; and has himself been repeatedly proceeded against, 12,437-8, 12,446-8, 12,454-6, 12,521-3. The feeling in Hackney and elsewhere as regards vaccination and its compulsory enforcement, 12,438, 12,463-70, 12,479-83, 12,496-9, 12,503-5, 12,515-23, 12,545-7; and the attitude of the Hackney Board of Guardians, 12,438, 12,468, 12,506-14, 12,520-3. Witness's opinion as to the effect of repeated proceedings under the Vaccination Acts in respect of the same children, 12,463-8, 12,500-2, 12,521-3.

Witness's opinion that magistrates do not give due effect to the provisions of the Vaccination Acts, allowing exemption where there is a reasonable excuse, 12,433-8, 12,441-2, 12,449-53, 12,457-61, 12,524-33; that occasionally the provision that the defendant in any proceedings under the Acts may appear by any member of his family or by any other person authorised by him is not regarded, 12,434-7, 12,443; as to differences in different places in the amount of the costs and fines imposed under the Acts, 12,443; and that the law is not evenly enforced on all alike, 12,438-41, 12,484-6.

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## BIGGS, MR. JOHN THOMAS (analysis of his evidence):

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vaccinations performed since 1849, and the Guardians' opinion that the law of compulsory vaccination could not be enforced in Leicester, 13,290-361, App. 413-4 (Tables A, B, and C); and as to the numbers given in the Guardians' returns as the successful vaccinations, public and private, for the years dealt with, 13,362-84.]

(Is a member of the Town Council of the Borough of Leicester, and was from 1883 to 1889 a member of the Board of Guardians of the Leicester Union, 13,296-300; and) is a plumber and sanitary engineer at Leicester, 13,586; and a member of the Board of Guardians of the Barrow-on-Soar Union, 13,609, 17,852. Witness's attention first directed to the subject of vaccination by the passing of the Vaccination Act of 1867, and the imprisonment, in default of payment of fines imposed under that Act, of his partner, 13,588, 13,598, 13,607; and from his experience of the small-pox epidemic at Leicester in 1872 he became an active opponent of the practice of vaccination, 13,589-90, 13,597-8, 13,607-9; the opinion he then formed being confirmed by subsequent reading, 13,607-8; and he has been fined several times under the Vaccination Acts, 13,599-602, 13,609. Believes that one of his brothers suffered from sore eyes in consequence of vaccination, 13,591-6, 13,609. The practice of insurance companies doing business in Leicester with regard to the granting of policies on the lives of unvaccinated persons, 13,690-716, 13,758-64, 14,426.

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17,070-4, 17,108-12, 17,126, 17,148-50, 17,185-203, 17,214, 17,216-7, 17,249-53, 17,290-4. The deaths returned by the Registrar-General as from erysipelas after vaccination or from cow-pox and other effects of vaccination, 13,754-6, 14,796-809, 15,330, 15,340, 15,345-6 (13,770), 17,270-2, 17,662, App. 416 (Table 3). Witness's opinion that in the case of deaths occurring after vaccination it is not always the practice of the medical men certifying the deaths to mention vaccination on their certificates, 13,776, 13,779, 13,790-4, 13,831-50, 13,883-4, 14,453-80, 14,774-6, 14,808-22, 15,199-201, 15,222-7, 15,246-54, 15,340-4, 15,355-66, 15,499, 15,538; and that accordingly the deaths returned by the Registrar-General as from the effects of vaccination are very largely exceeded in number by the actual deaths, 15,340-2, 15,345-6 (13,770), 15,368-85. Witness's opinion that public vaccinators do not as a rule carry out in full the instructions of the Local Government Board, 13,795, 13,807-16, 14,817, 14,821-3, 15,177-9, 15,218, 15,270-5, 15,290, 15,329.

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**CAVEN, THE REVEREND ROBERT, B.A.** (analysis of his evidence):

Is a Baptist minister at Leicester, and was formerly at Southampton, 14,710-1, 14,746. When at Southampton witness's experiences caused him to believe that vaccination was useless as a preventative of small-pox, and that it was often followed by serious consequences, 14,712-45, 14,753-9; and he has therefore refused to have his children vaccinated, 14,713, 14,723, and while at Southampton was fined under the Vaccination Acts five times in respect of one of his children and while at Leicester has been fined twice, once in respect of each of two others, 14,713, 14,747-52.

#### CEELY, MR. ROBERT :

Professor E. M. Crookshank on Mr. Ceely's observations on natural cow-pox in the cow, 11,303-35, 11,340-5; and Professor Crookshank's opinion that in regard to his description and drawing of the vesicles as umbilicated, Ceely attempted to harmonise his observations with the classical description of the inoculated disease, 11,306-35, 11,340-5, 11,441.

Professor Crookshank's opinion on Mr. Ceely's experiments in variolating cows, and on the nature of the disease conveyed by inoculation with the lymph derived therefrom, 11,436, 11,503-8, 11,518-31, 11,536-9, 11,879-80, 12,192, 12,283-332, 12,334, 12,336-50, 12,355-61, 12,379-82, App. 412.

#### CHALKLEY, EDITH :

Mr. J. T. Biggs as to the death, in his opinion due to vaccination, of the child Edith Chalkley of Derby in 1882, 15,291-303, 15,327-36.

Report to the Local Government Board by Dr. F. W. Barry on this case (29th November 1882), App. 484.

**CHAMBERLAIN, MR. LIONEL PERCY** (analysis of his evidence):

[Joint evidence with Messrs. Joseph Leeson and John Thomas Biggs, laying before the Commission a resolution passed by the Guardians of the Leicester Union, with a statement as to their administration of the Vaccination Acts in the Union and returns as to vaccinations performed since 1849, and the Guardians'



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opinion that the law of compulsory vaccination could not be enforced in Leicester, 13,290-361, App. 413-4 (Tables A., B., and C.); and as to the numbers given in the Guardians' returns as the successful vaccinations, public and private, for the years dealt with, 13,362-84.]

(Is clerk to the Leicester Board of Guardians, 13,290.)  
Furnished Mr. J. T. Biggs with the figures, so far as relating to the number of vaccinations, given by him on his Diagram A. (*App. facing page 434*), 15,754-5. As to the materials from which these figures were obtained and the methods by which they were arrived at, and as to how far the figures given are comparable throughout the years dealt with on the diagram, 15,755-878.

CHAMBERS, Mr. HENRY THOMAS (analysis of his evidence):

[Joint evidence with Messrs. Henry Lankester, John Stafford, Thomas Windley, John Thomas Biggs and John Storey, laying before the Commission certain resolutions passed by the Town Council of the Borough of Leicester with reference to compulsory vaccination, 12,924-4a.]

Is an Alderman and Justice of the Peace for the Borough of Leicester and has been twice Mayor, 13,003-4, 13,006-9, 13,022; and was for several years a member of the Board of Guardians, 13,005. Has adjudicated upon many cases under the Vaccination Acts, 13,010-11.

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COLIN M.:

M. Colin's cases of small-pox occurring among re-vaccinated hospital attendants referred to by Professor E. M. Crookshank, 12,389-95, 12,419.

CONVULSIONS:

Fatal case of convulsions ascribed to vaccination referred to by Mr. W. L. Beurle, 12,534-44.

CORDWENT, Mr. GEORGE, M.D. (analysis of his evidence):

Is deputy coroner for West Somerset and has been Public Vaccinator in the Pitminster and West Monkton districts of the Taunton Union, and in practice for fifty years, 12,548-51, 12,674-9, 12,704-6, 12,726, 12,793-6; and has seen a number of cases of small-pox occurring after vaccination, 12,552-6, 12,567-8, 12,571-83, 12,632-8, 12,658-68, 12,680-90, 12,695-703, 12,710-7, 12,721-5, 12,751, 12,773-7, 12,801-13; several after re-vaccination, 12,553; and one where vaccination and small-pox ran concur-

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Dr. G. Cordwint's opinion, based on certain experiments of his own, that it is impossible to inoculate cows successfully with humanized vaccine lymph, 12,690-4, 12,730-2, 12,756-8.

CROOKSHANK, PROFESSOR EDGAR MARCH, M.B. (analysis of his evidence):

Is Professor of Comparative Pathology and Bacteriology in and a Fellow of King's College, London, 10,324-5, and has given attention to the question of vaccination and cognate subjects, 10,326-9.

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#### EAGLE, MR. CHARLES (analysis of his evidence):

Is a shoe-laster at Belgrave, Leicester, 14,044. Particulars of the illness of one of witness's children, in his opinion due to vaccination, 14,047-53, 14,072; since the time of this illness witness has refused to have his other children vaccinated, 14,045-6, 14,054-5, 14,076-7, and has been fined three times, and twice imprisoned in default of payment, under the Vaccination Acts, 14,056-71, 14,073-85.

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Is a willow grower and manufacturer and worker in bamboo at Leicester, and since 1887 has been a member of the Board of Guardians of the Barrow-on-Soar Union, 17,969-72, 17,980-2. Cases where, in witness's opinion, ill-effects have resulted from vaccination, 17,974-80, 17,983-18,018: the case of the child Annie Hart, 17,978-9, 17,983-18,005, 18,009-18; and of the son of Mrs. M. A. Pearson, 17,979. In consequence of his belief that vaccination is attended



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EMMS, MR. ALFRED WILSON, M.R.C.S. (analysis of his evidence):

Is a medical man practising at Leicester, and Public Vaccinator for the Belgrave district of the Barrow-on-Soar Union, and a Justice of the Peace for the county of Leicester, 14,481-2, 14,550-7; and in June 1887 vaccinated the child Annie, the daughter of Mrs. Hart, 14,483. Contradicts certain statements made by Mrs. Hart in her evidence (14,216-63), and gives particulars as to the vaccination, and as to the child's subsequent illness and death, in witness's opinion entirely unconnected with the vaccination, 14,483-524, 14,532-49, 14,558-60, 14,564-71, 14,576-82, 14,592, 14,595-8, 14,629-36, 14,639-42. Witness's opinion as to erysipelas or other ill-effects arising from vaccination, 14,499, 14,525-31, 14,548, 14,583-94, 14,605-9, 14,637-8; and his usual procedure in vaccinating, 14,504, 14,511-4, 14,561-3, 14,591, 14,599-628.

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Mr. J. T. Biggs as to the cases of erysipelas following vaccination which occurred in 1876 in the Misterton district of the Gainsborough Union, Lincolnshire, 14,817-23, 15,175-221, 15,304-26, 15,368-85.

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## FEVERS:

Mr. J. T. Biggs's tables and diagrams, with his observations thereon, showing for the Borough of Leicester: for each of the years 1838-89, the number of deaths from each of the seven principal zymotic diseases (small-pox, measles, scarlet-fever, diphtheria, whooping cough, fevers and diarrhoea), (16,781-2), 16,925-6, 16,930-3, 16,983-5, App. 438 (Table 16); for the years 1838-89, the total number of deaths from each of the seven principal zymotic diseases with the per-centage of the deaths from each of those diseases to the total deaths from all of them, 16,926-9, App. 439 (Table 17); during the years 1838-89 in quinquennial periods, the total and the average annual number of deaths from each of the seven principal zymotic diseases with the average annual per-centage of registered vaccinations to births, 16,933-89, App. 439 (Table 18); for each of the years 1838-89, the death-rate from each of the seven principal zymotic diseases per million living with, for each of the years 1849-89, the per-centage of registered vaccinations to births, 16,990-17,000, 17,013-23, 17,180-2, 17,239-43, 17,290-4, App. 440 (Table 19); during the years 1838-89 in quinquennial periods, the average annual death-rate from each of the seven principal zymotic diseases per million living and the per-centage of the deaths from each of those diseases to the deaths from all of them with the average annual registered vaccinations to ten thousand births, 16,993, 16,996, 17,000-215, App. 441 (Table 20), App. facing page 441 (Diagram G.); during the years 1849-89 in quinquennial periods, the total number of deaths from small-pox and from fevers of children under five and under fifteen years of age and of persons at all ages and the proportion of such deaths under five and under fifteen years per cent. of the deaths from these diseases at all ages with the average annual per-centage of registered vaccinations to births, (17,500-12, 17,740-1), 17,752-807, App. 463 (Table 47); and, during the years 1838-89 in quinquennial periods, the total number of deaths at all ages from small-pox, from fevers, from the seven principal zymotic diseases and from all causes and the proportion of the deaths from small-pox, from fevers and from the seven principal zymotic diseases per cent. of the deaths from all causes with the average annual per-centage of registered vaccinations to births, 17,809-20, 17,839, App. 464 (Table 49), App. facing page 464 (Diagram P.).

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Is a marine store dealer at Aylestone Park, just beyond the Leicester borough boundary, 14,122, 14,131-2. Has been fined several times, and once imprisoned in default of payment, under the Vaccination Acts, 14,123-30, 14,133; but has not had any of his children vaccinated, 14,130, 14,134-5.

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**GAYTON, MR. WILLIAM, M.D. :**

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**"GREASE" :**

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**GREGORY :**

Dr. Gregory's opinion as to whether the character and number of the vaccination cicatrices bear any relation to the susceptibility to small-pox or to the fatality from the disease if acquired, referred to by Professor E. M. Crookshank, 11,898, 11,908-9.

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**GUY, MR. W. A., M.B. :**

Dr. Guy's conclusions in his paper on "Two hundred and fifty years of small-pox in London" (*Journal of the Statistical Society*, 1882, page 399) referred to, 10,497-9, 10,502, 10,709-11, 10,720, 10,915-7.

**HACKETT, MR. HARRY (analysis of his evidence) :**

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**HARRUP :**

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**HART, MR. ISRAEL (analysis of his evidence) :**

Has been a member of the Leicester corporation since 1874, and has been three times Mayor, 13,483-7; and has adjudicated upon a small number of cases under the Vaccination Acts, 13,488-94, 13,525, 13,534-7.

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**HART, MRS. KATE (analysis of her evidence) :**

Lives at Leicester, 14,216. Particulars of the illness, occurring after vaccination, and subsequent death of witness's daughter Annie, 14,217-63; since the time of this illness witness has refused to have her other children vaccinated, 14,236-7.

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Evidence of Dr. John Headley Neale, who examined the child Annie Hart on the occasion of her being taken to the Leicester Infirmary, with reference to the case, 14,824-93.

Evidence of Mrs. Mary Ann Pearson, whose child was vaccinated at the same time and with the same lymph as the child Annie Hart, with reference to the case, 17,876-929.

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**HENLEY, MR. J. J. :**

Report to the Local Government Board by Mr. J. J. Henley and Dr. H. Airy on certain deaths and injuries alleged to have been caused by vaccination at Norwich (21st October 1882), App. 478.

**HODGSON, MR. ROBERT (analysis of his evidence) :**

Is a cabinet maker at Birmingham, formerly living at Leicester, 14,136. Mentions several cases where illness has in his opinion been caused by vaccination, 14,139; since seeing these cases witness has refused to have his children vaccinated, 14,137-40, and has been twice fined, and once imprisoned in default of payment, under the Vaccination Acts, 14,139-48.

**HOLT :**

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**HOPPS, THE REVEREND JOHN PAGE (analysis of his evidence) :**

Lives at Leicester, and has lived in the neighbourhood for 14 years, 14,691-2, 14,694; the feeling in Leicester as regards vaccination, and its compulsory enforcement, 14,693-701, 14,704-9; witness's own opinion that vaccination ought not to be compulsorily enforced, 14,693. The system adopted in Leicester in dealing with cases of small-pox, 14,693, 14,702-3.

**HOPWOOD, MR. CHARLES HENRY, Q.C. (analysis of his evidence) :**

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Lives at Leicester, 14,341. Particulars of the illness, occurring after vaccination, and subsequent death of witness's son Edward, 14,342-76; since the time of this illness witness has refused to have his other children vaccinated, 14,363-5, 14,377-8, and has described his experience at public meetings, 14,379-85.

[References in the evidence of Mr. J. T. Biggs to the case of the child Edward Jarrom, 15,229-30, 15,233-5, 15,239-59.]

## JENNER, DR. EDWARD :

Professor E. M. Crookshank's opinion that Jenner's own stock of lymph was lost in 1798, 11,178, 11,185, 11,679-80, 11,747-8, 11,764, 11,783, 11,795-809, 11,823-8, 11,846-7, 11,954-12,044; and as to the pedigree of Jenner's first stock of lymph, 11,178, 11,747, 11,796-9, 11,805, 11,957-8, 11,978, App. 410; of his Berkeley lymph, 11,978, App. 410; of his Stonehouse lymph, 11,802, 11,806-8, 11,823-5, 11,959-64, 11,978, 12,040-2, App. 410; of his stock of Woodville's lymph, 11,679-80, 11,748, 11,801-2, 11,807, 11,823-6, 11,836, 11,843, 11,846-7, 11,975, 11,977-8, 11,999-12,017, 12,031-42, 12,044-51, 12,053-6, App. 411; and of his Kentish Town lymph, 11,679-80, 11,748, 11,801, 11,826-8, 11,843, 11,847, 11,977, 11,979, 11,999-12,017, App. 411. Jenner's North Nibley lymph referred to by Professor Crookshank, 11,977, 11,979.

Professor Crookshank's opinion that in Jenner's own cases where the variolous test was applied either after vaccination or after casual cow-pox the results were unreliable, 11,660-7, 11,857, or the test failed, 11,779-81.

References by Professor Crookshank to outbreaks of cow-pox, occurring about the time of the publication of Jenner's "Inquiry," 11,186, 11,298, 11,303, 11,679, 11,748, 11,751, 11,783, 11,795, 11,801-2, 11,806, 11,823, 11,826-9, 11,833, 11,843, 11,846-7, 11,958-61, 11,964, 11,966-7, 11,975-9, 11,982-4, 12,044, 12,167. Professor Crookshank as to Jenner's description of natural cow-pox in the cow, 11,303.

Professor Crookshank's opinion as to the nature of the disease of horses called by Jenner "grease," 11,436, 11,450, 11,454, 11,464-6, 11,471-3.

## KEATE :

Keate's reported cases of inoculation for the cow-pox referred to by Professor E. M. Crookshank, 11,192.

## KEELING, MR. WILLIAM (analysis of his evidence) :

Is a sergeant of the Leicester borough police and from 1883 to 1888 was the summoning officer, 15,142-4, and had the management of the work of summoning defaulters under the Vaccination Acts and the control of the issue and execution of distress warrants where fines imposed under the Acts were not paid, 15,145-8, 15,150. The feeling in Leicester as regards vaccination, and its compulsory enforcement,

15,149-54, 15,161-74. Believes that one of his own children was ill for about seven years in consequence of vaccination, 15,155, 15,158-60, and has accordingly refused to have two younger children vaccinated, 15,155-7.

## KELSON :

Kelson's reported cases of inoculation for the cow-pox referred to by Professor E. M. Crookshank, 11,195, 11,198-200.

## KEMPSON, MR. WILLIAM (analysis of his evidence) :

Has been a member of the Leicester corporation since 1865, was elected Alderman in 1873, has been twice Mayor, and is a Justice of the Peace for the Borough, 13,448-52; and has adjudicated upon many cases under the Vaccination Acts, 13,453-4.

The feeling in Leicester as regards vaccination, and its compulsory enforcement, 13,456-82; the origin of the opposition now existing there to compulsory vaccination, 13,458-65, 13,469-82. Witness's own opinion that vaccination ought not to be compulsory enforced, 13,455-7, 13,467-71.

## KLEIN, MR. E. E., M.D. :

Dr. Klein's experiments in variolating cows referred to by Professor E. M. Crookshank, 11,427-8, 11,880, 12,191.

## LALAGADE, M. :

M. Lalagade's cases of re-vaccination referred to by Professor E. M. Crookshank, 11,606, 11,620-2, 11,642-3.

## LAMB :

Macpherson's and Lamb's experiments in variolating cows referred to by Professor E. M. Crookshank, 12,283.

## LANKESTER, MR. HENRY, M.R.C.S. (analysis of his evidence) :

[Joint evidence with Messrs. John Stafford, Henry Thomas Chambers, Thomas Windley, John Thomas Biggs and John Storey, laying before the Commission certain resolutions passed by the Town Council of the Borough of Leicester with reference to compulsory vaccination, 12,924-4a.]

Is a member of the Royal College of Surgeons, and Deputy-Mayor and a Justice of the Peace for the Borough of Leicester and has been Mayor, 13,040-2.

The feeling in Leicester as regards vaccination, and its compulsory enforcement, 13,045-51, 13,054-7, 13,065-7, 13,075-7, 13,109-11, 13,113-5, 13,117, 13,119; the origin of the opposition now existing there to compulsory vaccination, 13,115, 13,120-3. Witness's own opinion that vaccination ought not to be compulsorily enforced, 13,043-8, 13,063-5, 13,081-2; the general opinion of medical men in Leicester on this point, 13,049. Witness's opinion as to cases of erysipelas following vaccination, 13,068-74, 13,083-108.

The system adopted in Leicester in dealing with cases of small-pox, 13,051-63, 13,078-82, 13,116-8, 13,124-8.

## LAYET, DR. A. :

Dr. Layet's cases of re-vaccination referred to by Professor E. M. Crookshank, 11,606-50, 11,704-15, 11,719-21, 11,724-6, 11,817-20, 11,889-99, 11,915, 11,918, 12,103-4, 12,113-49, 12,152, 12,163, App. 407.

## LEAVESLEY, MR. JAMES (analysis of his evidence) :

Is a boot and shoe manufacturer at Leicester, a member of the Town Council and of the Board of Guardians of the Barrow-on-Soar Union, and was a member and for a time chairman of the Board of Guardians of the Leicester Union, 14,991-7, 15,017-9. Believes vaccination does not prevent small-pox and is capable of imparting disease, 14,998-9; and has accordingly refused to have some of his children vaccinated, 14,999, and been fined several times under the Vaccination Acts, 15,000-1. Cases where in witness's opinion ill-effects have resulted from vaccination, 15,000-25, 15,027-54; the cases of the children Annie Hart, 15,008-20, 15,027-32, 15,038-43, 15,047-50; Thomas Wardle, 15,021-4; and Constance May Wood, 15,025, 15,033-7, 15,044-6, 15,050-4.

The feeling in Leicester as regards vaccination, and its compulsory enforcement, 14,995-9, 15,026.



LEESON, MR. JOSEPH (analysis of his evidence):

[Joint evidence with Messrs. John Thomas Biggs and Lionel Percy Chamberlain, laying before the Commission a resolution passed by the Guardians of the Leicester Union, with a statement as to their administration of the Vaccination Acts in the Union, and returns as to vaccinations performed since 1849, and the Guardians' opinion that the law of compulsory vaccination could not be enforced in Leicester, 13,290-361, App. 413-4 (Tables A., B., and C.); and as to the numbers given in the Guardians' returns as the successful vaccinations, public and private, for the years dealt with, 13,362-84.]

Is a shoe manufacturer at Leicester, and a member of the Board of Guardians, of which Board he has been chairman, 13,385-7, 13,412. Particulars of the illness and subsequent death of one of witness's children, in his opinion due to vaccination, 13,390-404, 13,413-7; since the time of this illness witness has taken an active part in opposition to vaccination, 13,388-90, 13,405-9.

The feeling in Leicester as regards vaccination, and its compulsory enforcement, 13,407-12, 13,421-2; the absence there, during the period when defaulters under the Vaccination Acts were being prosecuted, of any repeated prosecutions in respect of the same children, 13,418-21.

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Resolution of the Town Council of the Borough of Leicester with reference to compulsory vaccination, 12,924-4a; resolution on the same subject of the Leicester School Board, 13,130-1. Resolution of the Guardians of the Leicester Union with a statement as to their administration of the Vaccination Acts in the Union, and returns as to vaccinations performed since 1849, and their opinion that the law of compulsory vaccination could not be enforced in Leicester, 13,290-361, App. 413-4 (Tables A., B., and C.); as to the numbers given in the Guardians' returns as the successful vaccinations, public and private, for the years dealt with, 13,362-84, 13,620-1, (15,578-699, 15,700-3, 15,706-7, 15,726-8, 15,993-16,082, 16,107-8, 16,179-83, 16,200-2, 16,689-759, 17,007-9, 17,029-38, 17,230-3, 17,255-6, 17,364-418, 17,449-53, 17,620-9, 17,836-7, 17,839-40; 15,754-878; 15,879-973). The discontinuance of prosecutions under the Vaccination Acts in the Leicester Union, 13,291, 13,295, 13,320-2, 13,335, 13,342, 13,345-51; 13,603-5, 13,613, 13,616, 13,628, 13,631; evidence of the Chief Constable of the Borough as to proceedings under the Acts during the years 1881-6, 15,084-106, and particulars given by other witnesses as to the number of prosecutions in the Union prior to their discontinuance, 13,291-4, 13,303-51; 13,613, 13,628-9, 13,639-66; App. 414 (Table C.); App. 415 (Table 1). The absence at Leicester during the period when defaulters under the Vaccination Acts were being prosecuted, of any repeated prosecutions in respect of the same children, 12,957; 13,418-21; 13,447; 13,541, 13,547; 14,006; 14,058; 13,613, 13,629, 13,642, 13,656-8. Statements by witnesses, magistrates for the Borough of Leicester, who have adjudicated upon cases under the Vaccination Acts, as to the course taken by them with regard to the provisions of the Acts allowing exemption where there is a reasonable excuse, 12,941-4, 12,950-6, 12,958-66, 12,987-91; 13,024-8; 13,433. The opinion of various witnesses living at Leicester that vaccination ought not to be compulsorily enforced, 12,939-40, 12,946, 12,968-71; 13,015-6; 13,043-8, 13,063-5, 13,081-2; 13,205-6, 13,208, 13,256, 13,261, 13,265-81; 13,434-5; 13,455-7, 13,467-71; 13,499-500, 13,507-8, 13,519-21, 13,538-40, 13,548-51, 13,555; 13,572-3, 13,577-9, 13,585; 13,997-9, 14,011-4; 14,034; 14,693; 14,929-30, 14,943, 14,947, 14,953-4; 13,597. Mr. J. T. Biggs as to the administration of the Vaccination Acts in the Leicester Union, 13,603-5, 13,611-8, 13,622-77, 13,717-53, 14,426, 15,502, 15,538-51, 15,748, 16,022, 16,082-3, 16,379-83, App. 415 (Table 1); and as to the returns made to the House of Commons of persons imprisoned under the Acts, so far as relating to Leicester, 15,540-51, 16,082-3.

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82; 13,495-8, 13,500, 13,521-43, 13,552-8; 13,569-72, 13,574-85; 13,963-70, 13,973-5, 13,987-9; 13,997-14,014; 14,034; 14,058-61; 14,693-701, 14,704-9; 14,930-45, 14,951-4; 14,995-9, 15,026; 15,095-106; 15,142-54, 15,161-74; 13,611-3, 13,618, 13,628-9, 13,632-3, 13,639-65, 13,674-89, 14,426, 15,400, 15,405, 15,421-6, 15,430-1, 15,444-9, 15,452-3, 15,495-8, 15,538, 16,379-83, 17,866-74; 17,980; as to the origin of the opposition now existing there to compulsory vaccination, 13,291-5, 13,318; 12,932-7, 12,967, 12,992, 12,999-13,002; 13,115, 13,120-3; 13,421; 13,436-40; 13,458-65, 13,469-82; 13,521-2, 13,526-33, 13,552-4; 13,584-5; 13,965-7, 13,973-5, 13,987; 13,997-14,000, 14,007-14; 14,058-61; 14,377-85; 14,694-5; 14,998-9; 13,611-3, 13,639, 14,426. Statements by witnesses living or having lived in Leicester or Leicestershire, as to their having refused to have their children, or some of them, vaccinated, or as to their having otherwise taken an active part in opposition to vaccination, owing to their belief that members of their families, or other persons known to them, have suffered ill effects in consequence of vaccination, 13,388-409, 13,413-7; 13,888-921; 13,923-47; 13,949-62, 13,971-2, 13,976-86, 13,990-2; 14,045-85; 14,087-121; 14,123-35; 14,139-48; 14,217-63; 14,265-303; 14,304-40; 14,342-85; 14,386-420; 14,645-8; 14,654-67; 14,713-58; 14,959-88; 14,999-15,054; 15,056-83; (15,108-38); 15,140-1; 15,155-60; 17,973-80. Mr. J. T. Biggs as to cases where parents, on being proceeded against in Leicester under the Vaccination Acts, have stated in defence their belief that the illness or death of members of their families or other persons has been caused by vaccination, 13,717-44, 13,749-53, 13,765-89, 13,824-31, 13,841-4, 15,229-38, 17,276-7; and as to other cases of the like nature where the parents' belief was held to be a reasonable excuse for the non-vaccination of their children in regard to whom the proceedings were taken, 13,743-8, 13,752, 13,765, 15,392, 17,276-7. Mr. J. T. Biggs's table, with his observations thereon, of cases brought to the knowledge of the Leicester and County Anti-Vaccination Society of injuries and deaths alleged by parents living in Leicester or Leicestershire to have been caused by vaccination, and of cases of small-pox occurring in vaccinated persons, 15,386-498, 15,513-21, 16,084-107, 16,885, 16,924, 17,276-7, App. 417 (Table 4).

The system adopted in Leicester in dealing with cases of small-pox, 13,145-204, 13,206-30, 13,249-64, 13,283-9; 12,949; 13,021; 13,051-63, 13,078-82, 13,116-8, 13,124-8; 13,500-18, 13,520, 13,544-6, 13,560-1; 14,693, 14,702-3; 14,894-920; 15,728-45, 16,129-33, 16,203-688, 16,789, 16,796-809. Mr. T. Windley as to sanitary improvements effected in Leicester since 1872, 13,231, 13,234. Mr. J. T. Biggs's diagram showing the number of small-pox cases in and near Leicester which have come to the knowledge of the Medical Officers of Health for the Borough since the subsidence of the epidemic of 1871-3, 16,205-391, 16,522-6, 16,531, 16,617-43, 16,669-71, 16,789, 16,796-808, 17,351-63, App. facing page 435 (Diagram D.); and his tables showing for the years 1886, 1887, and 1888, the number of persons vaccinated or re-vaccinated after voluntarily entering the quarantine wards at the fever hospital after possible exposure to small-pox infection, (16,210, 16,376), 16,394-446, 16,644, 16,655-68, App. 435 (Table 9), and, for each of the years 1874-89, the number of persons who voluntarily entered the quarantine wards at the fever hospital after possible exposure to small-pox infection, with the estimated cost of such cases, and also the number of small-pox cases for each of the same years, (16,436-7, 16,481), 16,532-52, 16,572, 16,583-4, 16,594-7, App. 435 (Table 10).

Mr. J. T. Biggs as to erysipelas in Leicester, 13,796-806, 13,817-23, 13,861-2, 14,427-52, 14,760-96, App. 416 (Table 2), and the question of its connexion with the practice of vaccination, 13,861-2, 14,438-51, 14,760-96, 15,347-54; and as to the practice of insurance companies doing business in Leicester with regard to the granting of policies on the lives of unvaccinated persons, 13,690-716, 13,758-64, 14,426.

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Mr. J. T. Biggs's tables and diagrams, with his observations thereon, showing for the Borough of Leicester: for each of the years 1838-89, the small-pox death-rate per million living, 15,720-53, 16,109-51, 16,784, 17,045, App. 434 (Table 5), App. facing page 434 (Diagram B.); for each of the years 1849-89, the number of registered vaccinations to each five thousand births, 15,722-53, 16,109-51, 16,193, 17,315, App. 434 (Table 6), App. facing page 434 (Diagram B.); for each of the years 1849-89, the number of registered vaccinations per hundred thousand of the population, 15,726-53, 16,109-51, 16,193, 17,315, App. 434 (Table 7), App. facing page 434 (Diagram B.); for the highest years of epidemics during a period of fifty-two years (1838-89), the small-pox death-rate per million living, the average annual registered vaccinations to every five thousand births, and the accumulated vaccinations per hundred thousand living for the five years ending with, and including, each epidemic year, 16,152-200, 16,527-8, 16,911-24, 17,840-52, App. 434 (Table 8), App. facing page 434 (Diagram C.); during the years 1838-89 in quinquennial periods, the average annual small-pox death-rate per million living, the average annual registered vaccinations to every thousand births and the accumulated vaccinations per hundred thousand living at the close of each period, 16,759-64, 16,864-8, App. 435 (Table 11), App. facing page 435 (Diagram E.); during the years 1849-89 in quinquennial periods, the total number of small-pox deaths, the average annual small-pox death-rate per million living, the accumulated vaccinations per hundred thousand living at the close of each period, the average annual number of registered vaccinations per twenty-five thousand living, and the average annual number of sanitary orders to abate nuisances, 16,764-810, 16,864-8, App. 435 (Table 12), App. facing page 435 (Diagram F.); for each of the years 1838-89 the small-pox death-rate per million living, for each of the years 1849-89 the per-centage of registered vaccinations to total births, for each of the years 1862-89 the per-centage of registered vaccinations to births after deducting the dead unvaccinated and for each of the years 1853-89 the accumulated vaccinations registered for the five years ending with the enumerated year, (16,793), 16,811-22, 16,864-8, App. 436 (Table 13); during the years 1838-89 in quinquennial periods, the average annual small-pox death-rate per million living, the average annual per-centage of registered vaccinations to total births and to births after deducting the dead unvaccinated, and the accumulated vaccinations registered for the whole of each period, 16,822-9, 16,864-8, App. 436 (Table 14); during the years 1849-89 in quinquennial

periods, the number of persons registered as vaccinated with the balance of the population, 16,830-910, App. 437 (Table 15); for each of the years 1838-89, the number of deaths from each of the seven principal zymotic diseases, (16,781-2), 16,925-6, 16,930-3, 16,983-5, App. 438 (Table 16); for the years 1838-89, the total number of deaths from each of the seven principal zymotic diseases with the per-centage of the deaths from each of those diseases to the total deaths from all of them, 16,926-9, App. 439 (Table 17); during the years 1838-89 in quinquennial periods, the total and the average annual number of deaths from each of the seven principal zymotic diseases with the average annual per-centage of registered vaccinations to births, 16,933-89, App. 439 (Table 18); for each of the years 1838-89, the death-rate from each of the seven principal zymotic diseases per million living with, for each of the years 1849-89, the per-centage of registered vaccinations to births, 16,990-17,000, 17,013-23, 17,180-2, 17,239-43, 17,290-4, App. 440 (Table 19); during the years 1838-89 in quinquennial periods, the average annual death-rate from each of the seven principal zymotic diseases per million living, and the per-centage of the deaths from each of those diseases to the deaths from all of them with the average annual registered vaccinations to ten thousand births, 16,993, 16,996, 17,000-215, App. 441 (Table 20), App. facing page 441 (Diagram G.); during the years 1838-89 in quinquennial periods, the average annual number of deaths and the average annual death-rate from the seven principal zymotic diseases per million living, and from six of those diseases (excluding small-pox) with the average annual registered vaccinations per two hundred and fifty thousand living, and the average annual number of sanitary orders to abate nuisances, 17,215-94, App. 441 (Table 21), App. facing page 441 (Diagram H.); for each of the years 1838-89, the registered number of persons married, of births and of deaths with the estimated population at the middle of each year, 17,294-5, App. 442 (Table 22); for each of the years 1838-89, the rate per thousand living of persons married, of births and of deaths with the per-centage of registered vaccinations to births, 17,295, 17,299-305, 17,419-47, App. 442 (Table 23), App. facing page 442 (Diagram J.); during the years 1838-89 in quinquennial periods, the average annual registered number and the average annual rate per thousand living of persons married, of births and of deaths with the average annual registered vaccinations per hundred thousand living, 17,295-300, 17,306-49, 17,419-47, App. 443 (Table 24), App. facing page 443 (Diagram K.); for each of the years 1838-89, the registered number of deaths from all causes at all ages and at certain life-periods, 17,454, App. 445 (Table 27); for each of the years 1838-89, the death-rate from all causes per thousand living at all ages and at certain life-periods with, for each of the years 1849-89, the per-centage of registered vaccinations to births, 17,454-6, App. 446 (Table 28); during the years 1838-89 in quinquennial periods, the average annual registered number of deaths from all causes at all ages and at certain life-periods with the average annual per-centage of registered vaccinations to births, 17,456-7, App. 447 (Table 29); during the years 1838-89 in quinquennial periods, the average annual death-rate from all causes per thousand living at all ages and at certain life-periods with the average annual per-centage of registered vaccinations to births, 17,457-91, App. 447 (Table 30); for each of the years 1838-89, the registered number of deaths from all causes at all and under certain ages, 17,491, App. 448 (Table 31); for each of the years 1838-89, the death-rate from all causes per thousand living at all and under certain ages with, for each of the years 1849-89, the per-centage of registered vaccinations to births, 17,491-9, 17,836-7, App. 449 (Table 32); during the years 1838-89 in quinquennial periods, the average annual registered number of deaths from all causes at all and under certain ages with the estimated population at the middle of each period, 17,513-5, App. 450 (Table 33); during the years 1838-89 in quinquennial periods, the average annual death-rate from all causes per thousand living at all and under certain ages with the average annual per-centage of registered vaccinations to births, 17,513-616, App. 450 (Table 34), App. facing page 450 (Diagram M.); during the years 1838-89 in quinquennial periods, the average annual registered number of deaths with the average



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Mr. J. T. Biggs's opinion that Public Vaccinators do not, as a rule, carry out in full the instructions of the Local Government Board, 13,795, 13,807-16, 14,817, 14,821-3, 15,177-9, 15,218, 15,270-5, 15,290, 15,329.

Report to the Local Government Board by Mr. J. Netten Radcliffe, on certain cases of erysipelas, following upon vaccination, in the Misterton district of the Gainsborough Union, Lincolnshire, and in adjoining districts of the same Union and of the East Retford Union (16th December 1876), App. 466.

Report to the Local Government Board by Mr. J. J. Henley and Dr. H. Airy on certain deaths and injuries alleged to have been caused by vaccination at Norwich (21st October 1882), App. 478. Memorandum by the Medical Officer of the Local Government Board on the probable origin of erysipelas at the Norwich public vaccination station in June 1882 (4th November 1882), App. 482.

Report to the Local Government Board by Dr. F. W. Barry on a death alleged to have been caused by vaccination in the northern district of the Derby Union (29th November 1882), App. 484.

Report to the Local Government Board by Dr. E. Ballard on an inquiry into a fatal case of post-vaccinal erysipelas occurring at New Humberston, Billesdon Union (4th December 1888), App. 489.

#### LUNN, Mr. CHARLES (analysis of his evidence):

Is a hosiery manufacturer at Leicester, 15,055. Believes that two of his children have suffered from sore eyes resulting from vaccination, 15,057-66, 15,072-81; and has accordingly refused, since the vaccination of the second of these two, to have his children vaccinated, 15,056-8, 15,067-8, and been fined on several occasions under the Vaccination Acts, 15,068-71, 15,082-3. States that he entertains a strong feeling on the matter not only on his own account, but because he believes that his father and uncle, who were inoculated with small-pox, suffered from their inoculation very severe attacks of that disease, 15,070; and reads extracts from letters received by him, on the subject of compulsory vaccination, from the late Mr. P. A. Taylor, Mr. A. McArthur, and Mr. John Bright to whom he wrote as Members of Parliament, 15,071.

[Reference in the evidence of Mr. J. T. Biggs to circumstances attending the execution of a distress warrant issued in default of payment by Mr. Lunn of a fine imposed under the Vaccination Acts, 13,673.]

#### LYMPH:

Professor E. M. Crookshank on organisms present in vaccine lymph, 11,059-79, 11,090, 11,104-11, 11,120-2, 11,218-26; his opinion that they are more abundant in calf-lymph than in humanized, 11,063-4, 11,077-89; and as to the microscopic examination of lymph, 11,112-9, 11,123-5, and the possibility or otherwise of distinguishing lymph containing the virus of syphilis, 11,113, 11,118-9, 11,123-9.

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lymph derived from small-pox without having passed through the cow: Adams's cases referred to by him, 10,434-7, 10,440, 11,140-50, 11,152-63, 11,170-6, 11,178, 11,241, 11,246, 11,253-62, 11,266-8, 11,273, 11,776, 11,839, 12,029, 12,062, 12,078, 12,080, 12,283; Guillou's cases, 10,437, 10,440, 11,150-73, 11,178-9, 11,241, 11,246, 12,029, 12,283. Thiele's "lacto-vario-line" lymph referred to, 12,283. Professor Crookshank's opinion as to the sources of Woodville's and Pearson's lymph, 11,178, 11,182, 11,185-6, 11,679, 11,748, 11,750-6, 11,829-33, 12,044; that Jenner's own stock of lymph was lost in 1798, 11,178, 11,185, 11,679-80, 11,747-8, 11,764, 11,783, 11,795-809, 11,823-8, 11,846-7, 11,954-12,044; that lymph was then circulated by Woodville and Pearson which became the current lymph in England and on the continent, 11,178, 11,185-90, 11,201-2, 11,204, 11,667-9, 11,673, 11,677-80, 11,689-96, 11,698-9, 11,735-45, 11,747-56, 11,764, 11,779, 11,782-3, 11,795-811, 11,823-33, 11,836, 11,846-7, 11,954-12,044, 12,091; and his belief that the lymph thus circulated was, in fact, that of small-pox and not of cow-pox, 11,178-89, 11,192-208, 11,228-83, 11,502, 11,669-74, 11,681, 11,685, 11,702-3, 11,743, 11,750-77, 11,834-42, 11,979-80, 12,000, 12,021-35, 12,045-83, 12,087, 12,089, 12,283, 12,302, 12,333. Professor Crookshank's belief that this lymph was used in Ward's cases, 11,190-2, 12,048, 12,056, 12,078, 12,083; other cases in which, in his opinion, it was used: Redfearn's, 11,192; Evans's, 11,192, 11,227, 12,048, 12,056, App. 406; Holt's, 11,192; Stewart's, 11,192; Barrett's, 11,192; Keate's, 11,192; André's, 11,192; Ring's, 11,192, 11,228-9, 12,078, 12,083; Kelson's, 11,195, 11,198-200; and Stromeier's, 11,204. Harrup's cases referred to, 11,204, 12,048, 12,056, 12,078, 12,083. Professor Crookshank as to the pedigree of Jenner's first stock of lymph, 11,178, 11,747, 11,796-9, 11,805, 11,957-8, 11,978, App. 410; of his Berkeley lymph, 11,978, App. 410; of his Stonehouse lymph, 11,802, 11,806-8, 11,823-5, 11,959-64, 11,978, 12,040-2, App. 410; of Darke's stock of Stonehouse lymph, 11,966, 11,975, 12,087-8, App. 411; of Jenner's stock of Woodville's lymph, 11,679-80, 11,748, 11,801-2, 11,807, 11,823-6, 11,836, 11,843, 11,846-7, 11,975, 11,977-8, 11,999-12,017, 12,031-42, 12,044-51, 12,053-6, App. 411; and of his Kentish Town lymph, 11,679-80, 11,748, 11,801, 11,826-8, 11,843, 11,847, 11,977, 11,979, 11,999-12,017, App. 411. References by Professor Crookshank to Thornton's stock of Stonehouse lymph, 11,964-6; and Jenner's North Nibley lymph, 11,977, 11,979.

Professor Crookshank on experiments in variolating cows, and the nature of the disease conveyed by inoculation with lymph derived therefrom, 11,419, 11,422-4, 11,427-8, 11,431-6, 11,503-8, 11,518-31, 11,536-41, 11,879-80, 12,067-74, 12,185, 12,191-2, 12,283-332, 12,334, 12,336-50, 12,355-73, 12,379-82.

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## McMICHAEL:

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## MACPHERSON:

Macpherson's and Lamb's experiments in variolating cows referred to by Professor E. M. Crookshank, 12,283.

## MALAISE:

Dr. G. Cordwint's opinion that vaccination in some cases gets up malaise, 12,564, 12,567-70, 12,602-3, 12,610-26, 12,718-20, 12,727, 12,734-8; and that in such cases the vaccinated persons are protected from small-pox during the time the malaise remains, 12,564, 12,569, 12,591, 12,599-606, 12,611-3, 12,662-3, 12,736-8, 12,745-8, 12,750, 12,759-66, 12,770, 12,778-9; in his belief usually a period of about two years, 12,601, 12,604-9, 12,662-3, 12,771-2, 12,782-4, or longer in the case of an adult, 12,607-9, 12,778, 12,785-6. Dr. Cordwint's opinion that where vaccination, though apparently successful, does not set up malaise there is no protection whatever, 12,564-70, 12,591, 12,598, 12,610-3, 12,662, 12,664-8, 12,707-9, 12,770-4; though he is not prepared to say that vaccination has no influence on the fatality of small-pox if acquired, 12,800, 12,808-10.

## MARSHALL:

Marshall's reported cases of cow-pox inoculation in which the variolous test was applied, referred to by Professor E. M. Crookshank, 11,679-80, 11,826, 11,836-47, 11,975-8, 11,984, 11,987-8, 11,991, 11,999-12,020, 12,024, 12,028-9, 12,031-41, 12,045-6, 12,079, 12,081, 12,088, App. 411.

## MARSON:

The statistics collected by Mr. Marson showing a relation between the death-rate of small-pox patients and the number of vaccination cicatrices borne by them, referred to by Professor E. M. Crookshank, 11,896, 11,899-902, 11,906-7, 11,917-9, 11,921-2. Mr. Marson's cases of immunity from small-pox of re-vaccinated hospital attendants referred to by Professor Crookshank, 12,413-9.

## MARTIN:

Martin's experiments in variolating cows referred to by Professor E. M. Crookshank, 12,292.

## MASKELL, MR. WILLIAM HENRY (analysis of his evidence):

Has been Vaccination Officer for the Leicester Union since 1868, and under the Vaccination Act of 1871 has kept the vaccination books for the Union since the end of that year, 15,879-98, 15,900-7, 15,924, 15,943-8, 15,962-73. The manner in which these books have been kept since that time, 15,903-31, 15,944-61.

Has had in his possession the vaccination books relating to the years prior to 1872, 15,883, 15,902; and states to what extent he assisted Mr. J. T. Biggs in obtaining from them certain figures relating to the number of vaccinations for those years, 15,899, 15,932, 15,933-4 (see 15,913-9), 15,935-42.

## MATTS, MR. HENRY (analysis of his evidence):

Is a retired plumber and glazier in Leicester, 14,023-4. Has had none of his children vaccinated, 14,039; and has been fined and imprisoned in default of payment, under the Vaccination Acts, 14,025-43.

[References in the evidence of Mr. J. T. Biggs to the imprisonment of Mr. Matts, 13,652-5, 15,540.]

## MEAD, DR. RICHARD:

Extracts from "A discourse on the plague" by Dr. Richard Mead (1720), App. 400.

## MEASLES:

Case of measles due in Mr. W. L. Beurle's opinion to vaccination, 12,443, 12,487-95.

Mr. J. T. Biggs's tables and diagram, with his observations thereon, showing for the Borough of Leicester: for each of the years 1838-89, the number of deaths from each of the seven principal zymotic diseases (small-pox, measles, scarlet-fever, diphtheria, whooping-cough, fevers, and diarrhoea), (16,781-2), 16,925-6, 16,930-3, 16,983-5, App. 438 (Table 16); for the years 1838-89, the total number of deaths from each of the seven principal zymotic diseases with the per-centage of the deaths from each of those diseases to the total deaths from all of them, 16,926-9, App. 439 (Table 17); during the years 1838-89 in quinquennial periods, the total and the average annual number of deaths from each of the seven principal zymotic diseases with the average annual per-centage of registered vaccinations to births, 16,933-89, App. 439 (Table 18); for each of the years 1838-89, the death-rate from each of the seven principal zymotic diseases per million living with, for each of the years 1849-89, the per-centage of registered vaccinations to births, 16,990-17,000, 17,013-23, 17,180-2, 17,239-43, 17,290-4, App. 440 (Table 19); and, during the years 1838-89 in quinquennial periods, the average annual death-rate from each of the seven principal zymotic diseases per million living, and the per-centage of the deaths from each of those diseases to the deaths from all of them with the average annual registered vaccinations to ten thousand births, 16,993, 16,996, 17,000-215, App. 441 (Table 20), App. facing page 441 (Diagram G).

## MISTERTON:

Mr. J. T. Biggs as to the cases of erysipelas following vaccination which occurred in 1876 in the Misterton district of the Gainsborough Union, Lincolnshire,



14,817-23, 15,175-221, 15,304-26, 15,368-85; reference by Mr. C. H. Hopwood to these cases, 15,980.

Report to the Local Government Board by Mr. J. Netten Radcliffe on certain cases of erysipelas, following upon vaccination, in the Misterton district of the Gainsborough Union, Lincolnshire, and in adjoining districts of the same Union and of the East Retford Union (16th December 1876), App. 466.

#### NATIONAL HEALTH SOCIETY:

Tract "Facts concerning vaccination" issued by the National Health Society, referred to by Mr. J. T. Biggs, 15,538.

NEALE, MR. JOHN HEADLEY, M.B., M.R.C.P. (analysis of his evidence):

Is one of the physicians to the Leicester Infirmary, 14,824-5. Was in 1887 assistant physician in charge of out-patients, 14,826, 14,858, and examined the child Annie, the daughter of Mrs. Hart, when brought to the Infirmary, 14,827, 14,829, 14,831, 14,839, 14,851-2, 14,859-62, 14,866-6a, 14,870. Contradicts a statement made by Mrs. Hart in her evidence (14,216-63 at 14,222) to the effect that he then stated that the child was suffering from blood-poisoning, and gives particulars relating to the case, 14,828-84. The child's condition when examined by witness, 14,831, 14,834-64, 14,869-76, 14,879-82; witness's opinion that she was then dying of Bright's disease, 14,831, 14,834-9, 14,854, 14,865-8. With one possible exception witness has never seen a case of blood-poisoning from vaccination, 14,883-93.

The system adopted in Leicester in dealing with cases of small-pox, 14,894-920.

#### NEW SOUTH WALES:

As to the methods adopted in New South Wales in dealing with small-pox, 11,047-8, 12,420.

#### NORWICH:

Mr. J. T. Biggs as to the cases of erysipelas following vaccination which occurred in 1882 in Norwich, 15,222-9, 15,262-90.

Report to the Local Government Board by Mr. J. J. Henley and Dr. H. Airy on certain deaths and injuries alleged to have been caused by vaccination at Norwich (21st October 1882), App. 478. Memorandum by the Medical Officer of the Local Government Board on the probable origin of erysipelas at the Norwich public vaccination station in June 1892 (4th November 1882), App. 482.

#### NURSES:

References by Professor E. M. Crookshank to M. Colin's cases of small-pox occurring among re-vaccinated hospital attendants, 12,389-95, 12,419; and to Mr. Marson's cases of immunity, 12,413-9. Professor Crookshank's opinion as to the advisability of inoculating with small-pox the nurses in small-pox hospitals, 12,399.

Dr. G. Cordwint's opinion as to the amount of protection afforded by re-vaccination to attendants in small-pox hospitals, 12,778-9.

PAYNE, MR. JOHN THOMAS (analysis of his evidence):

Is a shoe-rivetter at Leicester, 13,922. Particulars of the illness of witness's two eldest children, in his opinion due to vaccination, 13,925-32, 13,943-6; since the time of these illnesses witness has refused to have his other children vaccinated, 13,923-4, 13,933, 13,947, and has been fined on several occasions, and twice imprisoned in default of payment, under the Vaccination Acts, 13,935-42.

[References in the evidence of Mr. J. T. Biggs to the case of Mr. Payne's second child, 13,841-2; and to the imprisonment of Mr. Payne, 15,540-51, 16,082-3.]

#### PEARSON:

Professor E. M. Crookshank as to the sources of Woodville's and Pearson's lymph, 11,178, 11,182, 11,185-6, 11,679, 11,748, 11,750-6, 11,829-33, 12,044; and his opinion that Jenner's own stock of lymph was lost in 1798, 11,178, 11,185, 11,679-83, 11,747-8, 11,764, 11,783, 11,795-809, 11,823-8, 11,846-7, 11,954-12,044; that lymph was then circulated by Woodville and Pearson which became the current lymph in

England and on the continent, 11,178, 11,185-90, 11,201-2, 11,204, 11,667-9, 11,673, 11,677-80, 11,689-96, 11,698-9, 11,735-45, 11,747-56, 11,764, 11,779, 11,782-3, 11,795-811, 11,823-33, 11,836, 11,846-7, 11,954-12,044, 12,091; and his belief that the lymph thus circulated was, in fact, that of small-pox and not of cow-pox, 11,178-89, 11,192-208, 11,228-83, 11,502, 11,669-74, 11,681, 11,685, 11,702-3, 11,743, 11,750-77, 11,834-42, 11,979-80, 12,000, 12,021-35, 12,045-83, 12,087, 12,089, 12,283, 12,302, 12,333.

PEARSON, MRS. MARY ANN (analysis of her evidence):

Is a silk-winder at Belgrave, Leicester, 17,876. States that her child was vaccinated at the same time and with the same lymph as the child Annie, the daughter of Mrs. Hart, 17,877-8, 17,907, 17,911-3, 17,921-3, and gives particulars of her own child's subsequent illness, in her opinion due to vaccination, 17,879-88, 17,894-903, 17,924. States that she had often seen Mrs. Hart's child before her vaccination and that she saw her twice afterwards, 17,889, 17,904-9; the child's condition when seen by witness, 17,889-93, 17,909-10, 17,914-20, 17,925-9. As to other children vaccinated at the same time as Mrs. Hart's, 17,921-3.

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#### PFEIFFER:

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PRATT, MR. THOMAS (analysis of his evidence):

Is a painter and decorator at Leicester, 15,107. States that he has refused to have any of his children vaccinated mainly owing to his having read of Mr. Jonathan Hutchinson's cases of vaccino-syphilis, 15,108-10, 15,115-38, and that he has been fined several times under the Vaccination Acts, 15,111-4.

[References in the evidence of Mr. J. T. Biggs to circumstances attending the execution of a distress warrant issued in default of payment by Mr. Pratt of a fine imposed under the Vaccination Acts, 13,673, 13,677.]

#### "PREUSSEN," S.S.:

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Mr. C. H. Hopwood as to the decision in *Pilcher v. Stafford* (33 *Law Journal, Magistrates' Cases*, page 113) that, under the Vaccination Act of 1853 and the amending Act of 1861, a parent having been fined for neglecting to have a child vaccinated no further proceedings could be taken, 12,922-3, 15,974-4a; and as to the decision in *Allen v. Worthy* (*Law Reports*, 5 *Queen's Bench*, page 163) that, under Section 31 of the Vaccination Act of 1867, a parent having been fined for disobeying an order to have his child vaccinated may be proceeded against from time to time as long as the child remains unvaccinated and under fourteen years of age, 12,923, 15,974-4a. Mr. Hopwood as to prosecutions under the Vaccination Act of 1867 prior to the passing of the Act of 1871, 15,974a-6.

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## SADDINGTON, MR. GEORGE (analysis of his evidence):

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Extracts from Dr. Haygarth's "Sketch of a plan to exterminate the casual small-pox in Great Britain" (1793), App. 398.

Dr. G. Cordwint on cases of small-pox observed by him to have occurred after vaccination, 12,552-6, 12,567-8, 12,571-83, 12,632-8, 12,658-68, 12,680-90, 12,695-703, 12,710-7, 12,721-5, 12,751, 12,773-7, 12,801-13; on cases after re-vaccination, 12,553; and on a case where vaccination and small-pox ran concurrently, 12,583-92, 12,760-8. Dr. Cordwint as to the fact of his never having seen a case of small-pox occurring after small-pox, 12,557-63, 12,593-4, 12,737-44, 12,748-9, 12,814-5; his belief that such a case has never occurred, 12,737-44, 12,748, 12,814-7; and his opinion that inoculation with small-pox would afford absolute security against an attack of that disease, 12,737-44, 12,748-9. Dr. Cordwint's experience that small-pox always occurs in the most insanitary parts of towns, 12,700, 12,752-5, 12,780-1. Dr. Cordwint's opinion that vaccination in some cases sets up malaise, 12,564, 12,567-70, 12,602-3, 12,610-26, 12,718-20, 12,727, 12,734-8; and that in such cases the vaccinated persons are protected from small-pox during the time the malaise remains, 12,564, 12,569, 12,591, 12,599-606, 12,611-3, 12,662-3, 12,736-8, 12,745-8, 12,750, 12,759-66, 12,770, 12,778-9, in his belief

usually a period of about two years, 12,601, 12,604-9, 12,662-3, 12,771-2, 12,782-4, or longer in the case of an adult, 12,607-9, 12,778, 12,785-6. Dr. Cordwint's opinion that where vaccination, though apparently successful, does not set up malaise there is no protection whatever, 12,564-70, 12,591, 12,598, 12,610-3, 12,662, 12,664-8, 12,707-9, 12,770-4; though he is not prepared to say that vaccination has no influence on the fatality of small-pox if acquired, 12,800, 12,808-10. Dr. Cordwint's belief that the character and number of the vaccination cicatrices bear no relation to the susceptibility to small-pox, 12,722-6; and his opinion as to the comparative immunity of medical men from small-pox, 12,640-57, 12,669-73, 12,733; and as to the amount of protection afforded by re-vaccination to attendants in small-pox hospitals, 12,778-9.

Mr. J. Stansfeld's opinion as to the effect of sanitation on small-pox mortality, 12,879-80.

Mr. C. H. Hopwood as to the prohibition of small-pox inoculation by law, 12,918-9, 15,983-7.

Mr. T. Windley's opinion as to the effect of sanitation on small-pox mortality, 13,236-40.

The system adopted in Leicester in dealing with cases of small-pox, 13,145-204, 13,206-30, 13,249-64, 13,283-9; 12,949; 13,021; 13,051-63, 13,078-82, 13,116-8, 13,124-8; 13,500-18, 13,520, 13,544-6, 13,560-1; 14,693, 14,702-3; 14,894-920; 15,728-45, 16,129-33, 16,203-688, 16,789, 16,796-809. Mr. J. T. Biggs's diagram showing the number of small-pox cases in and near Leicester which have come to the knowledge of the Medical Officers of Health for the Borough since the subsidence of the epidemic of 1871-3, 16,205-391, 16,522-6, 16,531, 16,617-43, 16,669-71, 16,789, 16,796-808, 17,351-63, App. facing page 435 (Diagram D.); and his tables showing, for the years 1886, 1887, and 1888, the number of persons vaccinated or re-vaccinated after voluntarily entering the quarantine wards at the fever hospital after possible exposure, to small-pox infection, (16,210, 16,376), 16,394-446, 16,644, 16,655-68, App. 435 (Table 9), and, for each of the years 1874-89, the number of persons who voluntarily entered the quarantine wards at the fever hospital after possible exposure to small-pox infection with the estimated cost of such cases and also the number of small-pox cases for each of the same years, (16,436-7, 16,481), 16,532-52, 16,572, 16,583-4, 16,594-7, App. 435 (Table 10).

Mr. J. T. Biggs's diagram showing for the Borough of Leicester, for each of the years 1838-89 the estimated population and the number of marriages, of births and of deaths from all causes, from small-pox and from all zymotic diseases, with for each of the years 1849-89 the number of registered vaccinations, public and private, 15,553-720, 15,726-8, 15,742, 15,747, 15,993-16,082, 16,107-8, 16,113-9, 16,175-83, 16,193, 16,200-2, 16,689-759, 16,763, 16,812-22, 16,843, 17,007-9, 17,029-38, 17,230-3, 17,255-6, 17,364-418, 17,449-53, 17,836-7, 17,839-40, App. facing page 434 (Diagram A.); as to the materials from which the figures given on this diagram, so far as relating to the number of vaccinations, were obtained and the methods by which they were arrived at, and as to how far the figures given are comparable throughout the years dealt with on the diagram, (13,362-84, 13,620-1), 15,578-699, 15,700-3, 15,706-7, 15,726-8, 15,993-16,082, 16,107-8, 16,179-83, 16,200-2, 16,689-759, 17,007-9, 17,029-38, 17,230-3, 17,255-6, 17,364-418, 17,449-53, 17,836-7, 17,839-40; 15,754-878; 15,879-973. Mr. J. T. Biggs's tables and diagrams, with his observations thereon, showing for the Borough of Leicester: for each of the years 1838-89, the small-pox death-rate per million living, 15,720-53, 16,109-51, 16,784, 17,045, App. 434 (Table 5), App. facing page 434 (Diagram B.); for the highest years of epidemics during a period of 52 years (1838-89), the small-pox death-rate per million living, the average annual registered vaccinations to every five thousand births, and the accumulated vaccinations per hundred thousand living for the five years ending with, and including, each epidemic year, 16,152-200, 16,527-8, 16,911-24, 17,840-52, App. 434 (Table 8), App. facing page 434 (Diagram C.); during the years 1838-89 in quinquennial periods, the average annual small-pox death-rate per million living, the average annual registered vaccinations to every thousand births and the accumulated vaccinations per hundred thousand living at the close of each period, 16,759-64, 16,864-8, App. 435 (Table 11), App. facing page 435 (Diagram E.); during the years 1849-89 in quinquennial periods, the total number of small-pox



deaths, the average annual small-pox death-rate per million living, the accumulated vaccinations per hundred thousand living at the close of each period, the average annual number of registered vaccinations per twenty-five thousand living and the average annual number of sanitary orders to abate nuisances, 16,764-810, 16,864-8, App. 435 (Table 12), App. facing page 435 (Diagram F.); for each of the years 1838-89, the small-pox death-rate per million living, for each of the years 1849-89 the per-centage of registered vaccinations to total births, for each of the years 1862-89 the per-centage of registered vaccinations to births after deducting the dead unvaccinated, and for each of the years 1853-89 the accumulated vaccinations registered for the five years ending with the enumerated year, (16,793), 16,811-22, 16,864-8, App. 436 (Table 13); during the years 1838-89 in quinquennial periods, the average annual small-pox death-rate per million living, the average annual per-centage of registered vaccinations to total births and to births after deducting the dead unvaccinated, and the accumulated vaccinations registered for the whole of each period, 16,822-9, 16,864-8, App. 436 (Table 14); for each of the years 1838-89, the number of deaths from each of the seven principal zymotic diseases (small-pox, measles, scarlet-fever, diphtheria, whooping-cough, fevers, and diarrhoea), (16,781-2), 16,925-6, 16,930-3, 16,983-5, App. 438 (Table 16); for the years 1838-89, the total number of deaths from each of the seven principal zymotic diseases with the per-centage of the deaths from each of those diseases to the total deaths from all of them, 16,926-9, App. 439 (Table 17); during the years 1838-89 in quinquennial periods, the total and the average annual number of deaths from each of the seven principal zymotic diseases with the average annual per-centage of registered vaccinations to births, 16,933-89, App. 439 (Table 18); for each of the years 1838-89, the death-rate from each of the seven principal zymotic diseases per million living with, for each of the years 1849-89, the per-centage of registered vaccinations to births, 16,990-17,000, 17,013-23, 17,180-2, 17,239-43, 17,290-4, App. 440 (Table 19); during the years 1838-89 in quinquennial periods, the average annual death-rate from each of the seven principal zymotic diseases per million living and the per-centage of the deaths from each of those diseases to the deaths from all of them with the average annual registered vaccinations to ten thousand births, 16,993, 16,996, 17,000-215, App. 441 (Table 20), App. facing page 441 (Diagram G.); during the years 1838-89 in quinquennial periods, the total number of small-pox deaths at all ages and at certain life-periods, the average annual small-pox death-rate per million living at each age and the relative per-centage of such death-rates with the average annual per-centage of registered vaccinations to births, (17,500-12), 17,729-41, 17,746-8, (17,755, 17,776-807), App. 461 (Table 45); during the years 1838-89 in quinquennial periods, the total number of small-pox deaths at all and under and over certain ages, the average annual small-pox death-rate per million living at each age and the relative per-centage of such death-rates, with the average annual per-centage of registered vaccinations to births, 17,742-52, App. 462 (Table 46); during the years 1849-89 in quinquennial periods, the total number of deaths from small-pox and from fevers of children under five and under fifteen years of age and of persons at all ages and the proportion of such deaths under five and under fifteen years per cent. of the deaths from these diseases at all ages with the average annual per-centage of registered vaccinations to births, (17,500-12, 17,740-1), 17,752-807, App. 463 (Table 47); during the years 1849-89 in quinquennial periods, the total number of deaths from small-pox and from all causes of children under five and under fifteen years of age and the proportion of the deaths at those ages from small-pox per cent. of the deaths at the same ages from all causes with the average annual per-centage of registered vaccinations to births, 17,807-9, App. 463 (Table 48); and, during the years 1838-89 in quinquennial periods, the total number of deaths at all ages from small-pox, from fevers, from the seven principal zymotic diseases and from all causes and the proportion of the deaths from small-pox, from fevers and from the seven principal zymotic diseases per cent. of the deaths from all causes with the average annual per-centage of registered vaccinations to births, 17,809-20, 17,839, App. 464 (Table 49), App. facing page 464 (Diagram P.).

SMITH, THE REVEREND ALBERT (analysis of his evidence):

Is a clergyman, now living at Leicester, 14,955-8. Believes a younger brother of his suffered from the effects of vaccination, 14,961-2, and that he has since then seen other cases of its ill effects, 14,965-6, 14,972-3, 14,988-90; and has accordingly refused to have his children vaccinated with one exception, 14,959-63, in whose case, to avoid a second prosecution at a time when it would have interfered with his prospects of ordination, he had vaccination performed with one insertion only, his wife rubbing off the lymph with salt and water directly after the operation was performed, 14,968-70, 14,984-8. Has been fined on several occasions under the Vaccination Acts, 14,964-8, 14,975-83.

SMITH, MR. WILLIAM (analysis of his evidence):

Is a shoe rivetter at Belgrave, Leicester, 13,887. Particulars of the illness of one of witness's children, in his opinion due to vaccination, 13,890-5, 13,905-9, 13,921; since the time of this illness witness has refused to have his other children vaccinated, 13,888-90, 13,897-8, 13,918-20, and has been fined twice, and once imprisoned in default of payment, under the Vaccination Acts, 13,896-904, 13,911-7.

SONDERLAND:

Sonderland's experiments in variolating cows referred to by Professor E. M. Crookshank, 12,283.

STAFFORD, MR. JOHN (analysis of his evidence):

[Joint evidence with Messrs. Henry Lankester, Henry Thomas Chambers, Thomas Windley, John Thomas Biggs, and John Storey, laying before the Commission certain resolutions passed by the Town Council of the Borough of Leicester with reference to compulsory vaccination, 12,924-4a.]

Is an Alderman and Justice of the Peace for the Borough of Leicester, and has been twice Mayor, 12,925-9; and has adjudicated upon many cases under the Vaccination Acts, 12,930-1.

The feeling in Leicester as regards vaccination, and its compulsory enforcement, 12,932-8, 12,945, 12,947-8, 12,971-86, 12,992-13,000; the origin of the opposition now existing there to compulsory vaccination, 12,932-7, 12,967, 12,992, 12,999-13,002. The absence at Leicester, during the period when defaulters under the Vaccination Acts were being prosecuted, of repeated prosecutions in respect of the same children, 12,957. Witness's opinion that vaccination ought not to be compulsorily enforced, 12,939-40, 12,946, 12,968-71; and his course as a magistrate with regard to the provisions of the Vaccination Acts allowing exemption where there is a reasonable excuse, 12,941-4, 12,950-6, 12,958-66, 12,987-91.

The system adopted in Leicester in dealing with cases of small-pox, 12,949.

STAFFORD, MR. JOSIAH (analysis of his evidence):

Is a farmer at Billesdon, near Leicester, 14,653. Has refused to have his child vaccinated, 14,667, because he believes that his sister, vaccinated eight years before he was born, suffered from convulsions and epileptic fits in consequence, and that one of his brothers was thrown into convulsions by vaccination, 14,654-67.

STANSFELD, THE RIGHT HON. JAMES, M.P. (analysis of his evidence):

Is Member for Halifax, and has been twice President of the Local Government Board, 12,827-9, 12,853, 12,869.

Witness's opinion that, looking to the heavy balance of medical opinion in favour of the practice of vaccination, there is a sufficient case for moderate compulsion, 12,830, 12,838, 12,854-61, 12,864-5, 12,881-3, 12,897-9; and as to the nature of this compulsion, 12,831, 12,833, 12,839-43, 12,856-61, 12,882, 12,900-2, 12,908-12. The objections in witness's opinion to compulsory vaccination as at present enforced, and to the method of administering the law, 12,832-40, 12,845-9, 12,851-5, 12,862-8, 12,870-8, 12,885-95, 12,903-12; and his view that the supervision of vaccination might with advantage be entrusted to



the Medical Officers of Health of the County Councils, 12,842, 12,850-1, 12,857, 12,895.

Witness's opinion as to the effect of sanitation on small-pox mortality, 12,879-80.

#### STEVENSON :

Stevenson's reported cases of cow-pox inoculation in which the variolous test was applied referred to by Professor E. M. Crookshank, 11,677, 11,726-8, 11,735-46, App. 409.

#### STEWART :

Stewart's reported cases of inoculation for the cow-pox referred to by Professor E. M. Crookshank, 11,192.

#### STOREY, MR. JOHN (analysis of his evidence):

Joint evidence with Messrs. Henry Laukester, John Stafford, Henry Thomas Chambers, Thomas Windley, and John Thomas Biggs, laying before the Commission certain resolutions passed by the Town Council of the Borough of Leicester with reference to compulsory vaccination, 12,924-4a.

#### STRETTON, MR. CLEMENT (analysis of his evidence):

Is a solicitor at Leicester, and a Justice of the Peace for the Borough, and in 1868 became a member of the Corporation, and has since twice been mayor, 13,562-6, 13,572; and has adjudicated upon many cases under the Vaccination Acts, 13,567-71.

The feeling in Leicester as regards vaccination, and its compulsory enforcement, 13,569-72, 13,574-85; the origin of the opposition now existing there to compulsory vaccination, 13,584-5. Witness's own opinion that vaccination ought not to be compulsorily enforced, 13,572-3, 13,577-9, 13,585.

#### STROMEYER :

Stromeyer's reported cases of inoculation for the cow-pox referred to by Professor E. M. Crookshank, 11,204.

#### SUTTON :

Professor E. M. Crookshank's opinion as to the essential part of the "Suttonian" method of inoculation for small-pox, 10,350-6, 10,375-411, 10,432-3, 10,570-641, 10,654-75, 10,683, 10,752, 10,764-5, and the usual characteristics of the resulting disease, 10,374-5, 10,411-30, 10,432-8, 10,632-7, 10,642-3, 10,660, 10,663, 10,672, 10,676-81, 10,750-80, 10,795, 12,301, 12,308-12, App. 398.

#### SYPHILIS :

Professor E. M. Crookshank's opinion as to the possibility or otherwise of distinguishing lymph containing the virus of syphilis, 11,113, 11,118-9, 11,123-9.

Professor Crookshank's opinion that cow-pox and horse-pox are analogous to syphilis, 11,451, 11,474-528, 11,542-94; and that by reason of such analogy it is extremely doubtful whether many cases thought to be vaccino-syphilitic are so in fact, 11,492-5, 11,497, 11,549, 11,568, 11,572-5, 11,581-6.

Case mentioned by Mr. T. Wright believed by the family of the person affected to be vaccino-syphilitic, 14,947.

Mr. J. T. Biggs as to alleged cases of vaccino-syphilis, 15,453-91, 16,084-107, 15,521-38, 17,285-6.

#### TASMANIA :

As to the methods adopted in Tasmania in dealing with small-pox, and the state of the law there as to compulsory vaccination, 11,049-53.

#### THIELE :

Thiele's "lacto-varioline" lymph referred to by Professor E. M. Crookshank, 12,283. Thiele's experiments in variolating cows referred to by Professor Crookshank, 12,283.

#### THORNTON :

Thornton's stock of Stonehouse lymph referred to by Professor E. M. Crookshank, 11,964-6.

#### THORNTON, MR. THOMAS WILLIAM (analysis of his evidence):

Is a farmer at Tugby near Leicester, and formerly lived in Leicester, 14,643-4. Is of opinion from his experience in his own family that vaccination is of no use in prevention of small-pox, 14,646-7, 14,649-52, and mentions cases where he believes persons have suffered from its effects, 14,647-8; and has accordingly refused

to have his children vaccinated, 14,645-6, 14,648, and been fined twice under the Vaccination Acts, 14,648.

#### TOLPUTT, Mrs. HANNAH (analysis of her evidence):

Lives at Belgrave, Leicester, 17,930. States that her child was vaccinated at the same time, but with different lymph, as the child Annie, the daughter of Mrs. Hart, 17,931-7, and gives particulars of her own child's subsequent illness, 17,938-46. States that she saw Mrs. Hart's child every day from the time of her vaccination to the day before her death, 17,947, 17,955, 17,968; the child's condition when seen by witness, 17,948-67.

#### VACCINATION :

As to the state of the law as to compulsory vaccination in Tasmania, 11,049-53.

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Professor Crookshank's opinion that cow-pox exercises no specific protective power in regard to small-pox, 11,564, 11,688, 11,794, 11,811-22, 11,857, 11,860, 11,864-76, 11,909, 11,990-1, 12,095, 12,170, 12,235-40, 12,249-82, 12,287-90, 12,339, 12,383-99, 12,412-7, 12,420, (and see 12,299-302, 12,355-65, and App. 412); but that there is evidence to show a temporary antagonism between the two diseases, 11,843-5, 11,848-52, 11,856-9, 11,869-76, 11,909, 11,989-98, 12,088, 12,092-173, 12,178, 12,184, 12,235-40, 12,249-82, 12,287-90, 12,339, 12,383-99, 12,412-7, 12,420, (12,299-302, 12,355-65, App. 412); and his belief as to the limit in point of time of this antagonism, 11,688, 11,849-51, 11,882-3, 12,092-149, 12,156-69. Professor Crookshank's opinion that the character and number of the vaccination cicatrices bear no relation either to the susceptibility to small-pox or to the fatality from the disease if acquired, 11,642-3, 11,889-953, 12,162-3; Mr. Marson's statistics tending to show the contrary, referred to by him, 11,896, 11,899-902, 11,906-7, 11,917-9, 11,921-2; and Dr. Gayton's, 11,906, 11,913, 11,922. Dr. Gregory's opinion upon this point referred to, 11,898, 11,908-9. M. Colin's cases of small-pox occurring among re-vaccinated hospital attendants, 12,389-95, 12,419; Mr. Marson's cases of immunity, 12,413-9. The comparative immunity of medical men from small-pox, 12,396-9, 12,417-8. Professor Crookshank's opinion that the practice of vaccination should be left to the discretion of the individual, 12,420.

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## WARD:

The cases of inoculation for the cow-pox published by Mr. Ward, the surgeon to the Manchester Infirmary, in 1799; Professor E. M. Crookshank's opinion that the lymph used was in fact that of small-pox and not of cow-pox, 11,190-2, 12,048, 12,056, 12,078, 12,083.

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## WARD, MR. JOSEPH (analysis of his evidence):

Is a hawker and traveller for hosiery living at Loughborough, 14,386-7. Particulars of the illnesses of three of witness's children, in his opinion due to vaccination, 14,388-96, 14,403; since the time of these illnesses witness has refused to have his other children vaccinated, 14,393, 14,396-9, 14,403, 14,406; though one of them was, in fact, vaccinated without his knowledge, 14,399-406; and witness has been fined on several occasions, and twice imprisoned in default of payment, under the Vaccination Acts, 14,399, 14,403, 14,407-20. States that his brother-in-law died of small-pox, at the age of 27 years, having been vaccinated in infancy, 14,421-5.

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Willan's reported cases of cow-pox inoculation in which the variolous test was applied referred to by Professor E. M. Crookshank, 11,729, 11,784-7, 11,792, 12,090-1.

## WINDLEY, MR. THOMAS (analysis of his evidence):

[Joint evidence with Messrs. Henry Lankester, John Stafford, Henry Thomas Chambers, John Thomas Biggs, and John Storey, laying before the Commission certain resolutions passed by the Town Council of the Borough of Leicester with reference to compulsory vaccination, 12,924-4a.]

Is an Alderman and chairman of the sanitary committee of the Leicester Town Council, 13,145-6. The system adopted in Leicester in dealing with cases of small-pox, 13,147-204, 13,206-30, 13,249-64, 13,283-9. The condition as regards vaccination of the attendants at the small-pox hospital, 13,209. Sanitary improvements effected in Leicester since 1872, 13,231, 13,234; and witness's opinion as to the effect of sanitation on small-pox mortality, 13,236-40.



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WOOD, Mrs. FANNY (analysis of her evidence):

Lives at New Humberstone, near Leicester, 14,149. Particulars of the illness, occurring after vaccination, and subsequent death of witness's daughter Constance, 14,150-215.

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WRIGHT, Mr. THOMAS (analysis of his evidence):

Is a solicitor at Leicester and a Justice of the Peace for the Borough, has been a member of the corporation for eleven years, and an Alderman since 1888, and has been Mayor, 14,921-6, 14,943-7; was for the year 1883 president of the league existing in the town against compulsory vaccination, 14,939, 14,943-4. Owing to the cessation in the Leicester Union of prosecutions under the Vaccination Acts witness has not adjudicated upon any such cases, 14,927-8, 14,948-9, but states the course he would take if a case came before him, 14,950.

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Mr. J. T. Biggs's diagram showing for the Borough of Leicester, for each of the years 1838-89, the estimated population and the number of marriages, of births and of deaths from all causes, from small-pox and from all zymotic diseases, with for each of the years 1849-89 the number of registered vaccinations, public and private, 15,553-720, 15,726-8, 15,742, 15,747, 15,993-16,082, 16,107-8, 16,113-9, 16,175-83, 16,193, 16,200-2, 16,689-759, 16,763, 16,812-22, 16,843, 17,007-9, 17,029-38, 17,230-3, 17,255-6, 17,364-418, 17,449-53, 17,620-9, 17,836-7, 17,839-40, App. facing page 434 (Diagram A.); as to the materials from which the figures given on this diagram, so far as relating to the number of vaccinations, were obtained and the methods by which they were arrived at, and as to how far the figures given are comparable throughout the years dealt with on the diagram, (13,362-84, 13,620-1), 15,578-699, 15,700-3, 15,706-7, 15,726-8, 15,993-16,082, 16,107-8, 16,179-83, 16,200-2, 16,689-759, 17,007-9, 17,029-38, 17,230-3, 17,255-6, 17,364-418, 17,449-53, 17,620-9, 17,836-7, 17,839-40; 15,754-878; 15,879-973.

Mr. J. T. Biggs's tables and diagrams, with his observations thereon, showing for the Borough of Leicester: for each of the years 1838-89, the number of deaths from each of the seven principal zymotic diseases, (16,781-2), 16,925-6, 16,930-3, 16,983-5, App. 438 (Table 16); for the years 1838-89, the total number of deaths from each of the seven principal zymotic diseases with the per-centage of the deaths from each of those diseases to the total deaths from all of them, 16,926-9, App. 439 (Table 17); during the years 1838-89 in quinquennial periods, the total and the average annual number of deaths from each of the seven principal zymotic diseases with the average annual per-centage of registered vaccinations to births, 16,933-89, App. 439 (Table 18); for each of the years 1838-89, the death-rate from each of the seven principal zymotic diseases per million living with, for each of the years 1849-89, the per-centage of registered vaccinations to births, 16,990-17,000, 17,013-23, 17,180-2, 17,239-43, 17,290-4, App. 440 (Table 19); during the years 1838-89 in quinquennial periods, the average annual death-rate from each of the seven principal zymotic diseases per million living and the per-centage of the deaths from each of those diseases to the deaths from all of them with the average annual registered vaccinations to ten thousand births, 16,993, 16,996, 17,000-215, App. 441 (Table 20), App. facing page 441 (Diagram G.); during the years 1838-89 in quinquennial periods, the average annual number of deaths and the average annual death-rate from the seven principal zymotic diseases per million living and from six of those diseases (excluding small-pox) with the average annual registered vaccinations per two hundred and fifty thousand living and the average annual number of sanitary orders to abate nuisances, 17,215-94, App. 441 (Table 21), App. facing page 441 (Diagram H.); and, during the years 1838-89 in quinquennial periods, the total number of deaths at all ages from small-pox, from fevers, from the seven principal zymotic diseases and from all causes and the proportion of the deaths from small-pox, from fevers and from the seven principal zymotic diseases per cent. of the deaths from all causes with the average annual per-centage of registered vaccinations to births, 17,809-20, 17,839, App. 464 (Table 49), App. facing page 464 (Diagram P.).

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LONDON: Printed by TYRE and SPOTTISWODE,  
Printers to the Queen's most Excellent Majesty.  
For Her Majesty's Stationery Office.

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VACCINATION COMMISSION.

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# FINAL REPORT

OF THE

# ROYAL COMMISSION

APPOINTED TO INQUIRE INTO THE SUBJECT OF

# VACCINATION.

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Presented to both Houses of Parliament by Command of Her Majesty.

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LONDON:

PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,

BY EYRE AND SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

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[C.—8270.] Price 1s. 10d.



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## ROYAL COMMISSIONS.

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### I.

*VICTORIA R.*

*Victoria*, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith,

**To** Our right trusty and well-beloved Councillor, Farrer, Baron Herschell, Our trusty and well-beloved: Sir James Paget, Baronet, Fellow of the Royal College of Surgeons, Sir Charles Dalrymple, Baronet, Sir William Guyer Hunter, Knight Commander of Our Most Distinguished Order of Saint Michael and St. George, Fellow of the Royal College of Physicians, Sir Edwin Henry Galsworthy, Knight, William Scovell Savory, Esquire, President of the Royal College of Surgeons, Charles Bradlaugh, Esquire, John Syer Bristowe, Esquire, Fellow of the Royal College of Physicians, William Job Collins, Esquire, Fellow of the Royal College of Surgeons, John Stratford Dugdale, Esquire, one of Our Counsel learned in the Law, Michael Foster, Esquire, Master of Arts, Professor of Physiology in Our University of Cambridge, Jonathan Hutchinson, Esquire, Fellow of the Royal College of Surgeons, James Allanson Picton, Esquire, Samuel Whitbread, Esquire, and Frederick Meadows White, Esquire, one of Our Counsel learned in the Law, greeting!

**Whereas** We have deemed it expedient that a Commission should forthwith issue to inquire and report as to—

- (1.) The effect of vaccination in reducing the prevalence of, and mortality from, small-pox.
- (2.) What means, other than vaccination, can be used for diminishing the prevalence of small-pox; and how far such means could be relied on in place of vaccination.
- (3.) The objections made to vaccination on the ground of injurious effects alleged to result therefrom; and the nature and extent of any injurious effects which do, in fact, so result.
- (4.) Whether any, and, if so, what means should be adopted for preventing or lessening the ill effects, if any, resulting from vaccination; and whether, and, if so, by what means, vaccination with animal vaccine should be further facilitated as a part of public vaccination.
- (5.) Whether any alterations should be made in the arrangements and proceedings for securing the performance of vaccination, and, in particular, in the provisions of the Vaccination Acts with respect to prosecutions for non-compliance with the Law.

**Now know ye**, that We, reposing great trust and confidence in your knowledge and ability, have authorised and appointed, and do by these presents authorise and appoint, you, the said Farrer, Baron Herschell; Sir James Paget; Sir Charles Dalrymple; Sir William Guyer Hunter; Sir Edwin Henry Galsworthy; William Scovell Savory; Charles Bradlaugh; John Syer Bristowe; William Job Collins; John Stratford Dugdale; Michael Foster; Jonathan Hutchinson; James Allanson Picton; Samuel Whitbread; and Frederick Meadows White; to be Our Commissioners for the purposes of the said inquiry.



And for the better effecting the purposes of this Our Commission We do by these presents give and grant unto you, or any five or more of you, full power to call before you such persons as you shall judge likely to afford you any information upon the subject of this Our Commission; and also to call for, have access to, and examine all such books, documents, registers, and records as may afford you the fullest information on the subject; and to inquire of and concerning the premises by all other lawful ways and means whatsoever.

And We do further by these presents authorise and empower you, or any five or more of you, to visit and personally inspect such places as you may deem expedient for the more effectual carrying out of the purposes aforesaid.

And We do by these presents will and ordain that this Our Commission shall continue in full force and virtue; and that you, Our said Commissioners, or any five or more of you, may, from time to time, proceed in the execution thereof, and of every matter and thing therein contained, although the same be not continued from time to time by adjournment.

And We do further ordain that you, or any five or more of you, have liberty to report your proceedings under this Our Commission from time to time, if you shall judge it expedient so to do.

And Our further Will and Pleasure is that you do with as little delay as possible report to Us, under your hands and seals, or under the hands and seals of any five or more of you, your opinion upon the several matters herein submitted for your consideration.

Given at Our Court at Saint James's the Twenty-ninth day of May one thousand eight hundred and eighty-nine; in the Fifty-second year of Our Reign.

By Her Majesty's Command.

HENRY MATTHEWS.

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## II.

## VICTORIA R.

**Victoria**, by the Grace of God, of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith, To Our trusty and well-beloved John Albert Bright, Esquire, greeting !

**Whereas** We did, by Warrant under Our Royal Sign Manual, bearing date the twenty-ninth day of May, One thousand eight hundred and eighty-nine, appoint Our right trusty and well-beloved Councillor, Farrer, Baron Herschell, together with the several gentlemen therein respectively mentioned, or any five or more of them, to be Our Commissioners to inquire and report as to—

- (1.) The effect of vaccination in reducing the prevalence of, and mortality from, small-pox.
- (2.) What means, other than vaccination, can be used for diminishing the prevalence of small-pox; and how far such means could be relied on in place of vaccination.
- (3.) The objections made to vaccination on the ground of injurious effects alleged to result therefrom; and the nature and extent of any injurious effects which do, in fact, so result.
- (4.) Whether any, and, if so, what means should be adopted for preventing or lessening the ill effects, if any, resulting from vaccination; and, whether, and, if so, by what means, vaccination with animal vaccine should be further facilitated as a part of public vaccination.
- (5.) Whether any alterations should be made in the arrangements and proceedings for securing the performance of vaccination, and, in particular, in the provisions of the Vaccination Acts with respect to prosecutions for non-compliance with the Law.

**And whereas** one of Our Commissioners so appointed, namely, Charles Bradlaugh, Esquire, has since deceased :

**Now know Ye** that We, reposing great confidence in you, do by these Presents appoint you, the said John Albert Bright, to be one of Our Commissioners for the purpose aforesaid in the room of the said Charles Bradlaugh, deceased, in addition to and together with the other Commissioners whom We have already appointed.

Given at Our Court at Saint James's the Eighth day of April one thousand eight hundred and ninety-one; in the Fifty-fourth year of Our Reign.

By Her Majesty's Command.

HENRY MATTHEWS.



## LIST OF APPENDICES TO THE COMMISSION'S FINAL REPORT.

---

### I.—Detailed discussion by the Commission of:—

- (A.) The “ Variolous Test ” (*on pages 143-145 of this volume*) ; and
- (B.) Woodville's cases (*on pages 145-153 of this volume*).

### II.—Tables, furnished by the Registrar-General, showing for England and Wales:—

- (A.) The deaths from small-pox at certain age-periods, to one thousand deaths from small-pox at all ages, in each year 1848-1894 (*on page 154 of this volume*) ; and
- (B.) The death-rates from small-pox, per million living at certain age-periods, in each year 1848-1894 (*on page 155 of this volume*).

### III.—Report to the Commission of Dr. Sidney Coupland on the outbreak of small-pox in the Dewsbury Union in 1891-2. (*In a separate volume.*)

### IV.—Report to the Commission of Dr. Arthur Pearson Luff on outbreaks of small-pox in London in 1892-3. (*In a separate volume.*)

### V.—Report to the Commission of Dr. Thomas Dixon Savill on the outbreak of small-pox in the Borough of Warrington in 1892-3. (*In a separate volume.*)

### VI.—Report to the Commission of Dr. Sidney Coupland on the outbreak of small-pox in the Borough of Leicester in 1892-3. (*In a separate volume.*)

### VII.—Report to the Commission of Dr. Sidney Coupland on the outbreak of small-pox in the City of Gloucester in 1895-6. (*In a separate volume.*)

### VIII.—Reports to the Commission of Dr. Sidney Coupland on the prevalence of small-pox in Glasgow, Liverpool, Salford, Manchester, Oldham, Chadderton, Leeds, Sheffield, Halifax and Bradford in 1892-3, and the measures adopted by the local authorities. (*In a separate volume.*)

### IX.—Papers relating to cases in which death or non-fatal injury has been alleged or suggested to have been caused by, or otherwise connected with, vaccination. (*In a separate volume.*)

- (A.) An analysis, prepared for the Commission by Dr. Sidney Coupland and Dr. Theodore Dyke Acland, of the reports made by Medical Inspectors of the Local Government Board on two hundred and five cases in which death, occurring on or between the 1st November 1888 and the 30th November 1891, had been alleged or suggested to have been connected with vaccination.
  - (B.) Memorandum, prepared by Dr. Edward Ballard and forwarded to the Commission by the Local Government Board, on the two hundred and five cases in which death, occurring on or between 1st November 1888 and the 30th November 1891, had been alleged or suggested to have been connected with vaccination, and which had been reported on by Medical Inspectors of the Local Government Board.
  - (C.) Reports on inquiries, made on behalf of the Commission, into cases in which death or non-fatal injury had been alleged or suggested to have been caused by, or otherwise connected with, vaccination; with other information as to certain cases, brought to the Commission's knowledge with a view to their investigation, into the circumstances of which inquiry was not made by medical men on behalf of the Commission.
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## FINAL REPORT.

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TO THE QUEEN'S MOST EXCELLENT MAJESTY.

MAY IT PLEASE YOUR MAJESTY,

WE, the undersigned Commissioners appointed to inquire into the subject of vaccination, desire humbly to submit to Your Majesty our Final Report.

2. In the First Report which we submitted to Your Majesty we indicated the method we proposed to adopt in pursuing the investigation committed to us. In a later Report we recommended certain changes in the law, upon the expediency of which all the members of the Commission were agreed, whatever the conclusion to which they might ultimately be led on the specific questions on which they were required to report. As no steps have been taken to give effect to these recommendations, we shall have to advert to the matter again hereafter.

3. Our inquiry has been a prolonged one. We would gladly have concluded our labours at an earlier date; but we thought it desirable to give full scope to the evidence of those who were opposed to vaccination, as well as those who favoured the practice, in order that, whatever the value of the opinions we expressed, they should at least be the fruit of an exhaustive inquiry. Moreover, a thorough and systematic investigation of certain local epidemics necessarily involved much expenditure of time, and it would not have been possible for us to arrive at a satisfactory conclusion as to the risk attending vaccination unless our examination of cases of alleged injury had extended over a considerable period.

4. We have held 136 meetings for the examination of witnesses, and have examined 187 witnesses. In addition to this, we have caused important investigations to be conducted for our assistance.

5. On the eighteenth occasion on which we met, we were invited to make a personal examination of two children who were alleged to have suffered from the effects of vaccination. Some of the members of the Commission, at the request of their colleagues, made the desired examination. It was felt, however, that it would be neither practicable nor expedient to pursue the same course in other cases in which injury from vaccination was alleged. Authority was accordingly obtained from the Treasury to secure the services of competent observers to make such investigations as might be called for. A large number of cases of alleged injury from vaccination brought to the notice of the Commission have thus been the subject of careful investigation.

6. In addition to an examination of cases of this nature, it seemed expedient that a complete and systematic inquiry should be made into the circumstances connected with important local epidemics of small-pox which occurred from time to time, with a view especially to see what light they threw on the question of the protective effect of vaccination. Inquiries were therefore instituted as regards local outbreaks in the Dewsbury Union in 1891-2, in London, in Warrington, and in Leicester, in 1892-3, and in Gloucester in 1895-6.

7. As regards other local outbreaks of small-pox, which occurred in Glasgow, in Liverpool, in Salford and Manchester, in Oldham and Chadderton, in Leeds, in Sheffield, in Halifax, and in Bradford, during the years 1892-3, more limited inquiries were instituted to ascertain the extent and character of the various outbreaks and the steps taken by the local authorities to deal with them.

8. The examination of cases of alleged injury from vaccination was made by Dr. Thomas Barlow, Dr. Theodore Dyke Acland, Dr. Sidney Coupland, Dr. Arthur Pearson Luff, and Dr. Thomas Dixon Savill; the local outbreaks of small-pox were reported on by Dr. Coupland, Dr. Luff, and Dr. Savill. We desire to record our sense of the value of the services which these gentlemen have rendered.



(A.) *As to the effect of vaccination in reducing the prevalence of, and mortality from, small-pox.*

9. The first of the questions submitted to us by Your Majesty is as to "the effect of vaccination in reducing the prevalence of, and mortality from, small-pox." This is obviously a fundamental question. It has been strenuously maintained by some that vaccination has not had, and, indeed, could not have had, any effect in controlling the spread of small-pox or in diminishing its virulence. They insist that the notion that it is, to any extent, a protection against small-pox rests on no scientific basis, that there is no relation between vaccinia and variola, and therefore no reason why those who have been subjected to vaccination should enjoy any immunity from, or protection against, small-pox. They insist, further, that as a matter of experience it is not proved that any such protection or immunity has been enjoyed by the vaccinated. The latter is manifestly the more important point. If the facts which have been accumulated, when fairly and impartially viewed, do really show that the vaccinated are either less liable to be attacked by small-pox, or if attacked suffer less severely, than the unvaccinated, any theory which rests on the basis that there is no possible connexion between vaccination and susceptibility to small-pox must evidently be regarded with distrust. If the protective effect of vaccination be thus established, then even if the relation of vaccinia to small-pox could not be explained, nor the reason why or the manner in which it affects human susceptibility to small-pox contagion, elucidated, it would still be quite reasonable to accept and act upon the conclusions to which experience directed us. The reason why the introduction of a particular drug into the human body produces certain phenomena may be incapable of explanation, but that it operates to produce these phenomena may be none the less certain. If, then, it be shown that vaccination has a protective influence against small-pox, or modifies the character of the disease, it is not necessary for the purpose of the inquiry upon which we are engaged to determine what is the true theory by which the effect is to be accounted for. To embark on such a scientific inquiry in any detail would be beyond the scope of our functions. If, again, experience does not warrant the assertion that vaccination tends to prevent the spread or mitigate the effects of small-pox, it is obviously immaterial whether this was *à priori* to be expected. At the same time, as it has been asserted with much confidence that science forbids a belief in the protective influence of vaccination, we have not thought it right to abstain altogether from dealing with this question. We shall, however, for the reasons we have given, discuss it much less in detail than the question what inferences ought to be drawn from the facts accumulated by the history of vaccination and small-pox in the period, now nearly a century, during which vaccination has been in use.

10. There was at the close of the eighteenth century, if not earlier, in districts where cow-pox had appeared, a belief among the dairy folk that those who had taken the cow-pox never took the small-pox; and indeed one Jesty, a Dorsetshire farmer, had in 1774, in the case of his wife and sons, purposely introduced the matter of cow-pox into the human subject with the view of protecting from small-pox.

*The introduction and rapid spread of the practice of vaccination.*

*Upon what was belief in the practice then founded?*

11. The practice, however, of inoculating with the matter of cow-pox, or vaccination as it was subsequently called, may be considered as dating from the publication of the "Inquiry into the Causes and Effects of the Variolæ Vaccinæ" of Edward Jenner, published in the summer of the year 1798. The practice rapidly spread, and prevailed widely in this country and other parts of western Europe during the first quarter of the present century. It was, beyond all question, so adopted in the genuine belief that it afforded protection against small-pox. Two questions at once present themselves. First, upon what was this belief founded; and, secondly, does the history of small-pox mortality from the time when the practice of vaccination became prevalent, support the view that it has such a protective influence?

12. Vaccinia or cow-pox is a disease affecting milch cows and marked by an eruption on the udder and teats. The disease can be communicated from the cow to man. Dairywomen and maids engaged in milking cows affected with cow-pox are apt to have sores of a special kind on their hands or elsewhere, the development of the sores being frequently accompanied by febrile symptoms. There can be no doubt that, in a certain number of cases at all events, such sores are the local manifestations of cow-pox; the virus from the eruption on the cow being introduced



into some scratch or other imperfection in the skin of the milker and there producing its local effects, accompanied more or less by general symptoms.

13. In the treatise to which reference has been made Jenner records in the first place a number (19) of cases in which a person who had accidentally taken cow-pox from the cow, had never had small-pox and appeared incapable of taking that disease; the insusceptibility being shown on the one hand by the failure to contract the disease after ample exposure to contagion, such as nursing and attending to or even sleeping with persons suffering from small-pox, and on the other hand by the fact that when the person in question was inoculated with the matter of small-pox in the manner then usual (the matter being tested as to its efficiency on susceptible persons) the inoculation failed to excite small-pox. In the course of the inoculation practice it had been observed that when the operation was performed upon a person who had already had small-pox, either naturally or by inoculation, the wound of inoculation, instead of developing as it did when the operation was successful in a person who had not had the small-pox, into a vesicle and so into a pustule with the variolous characters (the development being accompanied by febrile symptoms and, save in exceptional cases, by the appearance of a smaller or greater number of variolous pustules on parts of the skin other than the seat of inoculation), presented as a rule nothing more than some slight inflammation, dying away in a few days without any other symptom, or even healed at once without any symptoms at all, local or general; and in the exceptional cases in which further changes took place in the wound, these were not accompanied or followed by an eruption of pustules or even by the febrile and other general symptoms of small-pox. Accordingly, in cases of small-pox inoculation where it was doubtful whether the disease had been communicated, it had become not an uncommon practice to repeat the operation, in order to judge by the effects produced whether the earlier inoculation had or had not produced the disease; and the practice, thus originating in connexion with small-pox inoculation, had come to be spoken of as the "variolous test." We discuss the "variolous test" in greater detail in an appendix on pages 143-5.

14. In his treatise Jenner distinguishes between what he calls true cow-pox and other eruptions which he speaks of as spurious, and which he regarded as not affording protection against small-pox, although he gives no details to show that the cases quoted by him as affording protection were cases of his true cow-pox. He also developed the view that matter derived from horses suffering from the disease known as the grease is capable of giving rise to cow-pox in the cow, and indeed is the real origin of the true disease. It will be desirable to consider the questions relating to the grease of horses later on. It may be added that Jenner also expressed the opinion that the protection thus afforded by cow-pox was permanent in character.

15. Jenner further recorded in the same treatise how he had in 1796 inoculated a healthy boy of eight years of age in the arm with cow-pox matter taken from a sore on the hand of a dairymaid who had been infected with the disease by milking cows suffering from cow-pox. He describes the appearances subsequently presented by the wounds, and states that, six weeks afterwards, the results of inoculating the boy with variolous matter were those commonly seen to follow the inoculation of persons who had previously had the cow-pox or the small-pox; that is to say, the "variolous test" showed the boy to be insusceptible to small-pox. Some months afterwards the boy was again inoculated, but no sensible effect was produced on the constitution. Jenner then relates that subsequently, in the spring of 1798, he inoculated a child, and obtained a similar result with matter taken directly from the nipple of a cow infected with cow-pox; from the pustule on the arm of this child he inoculated another, and from this again several, and from one of these latter a fourth in succession, and then a fifth. To three of these the "variolous test" was applied, and it is stated with the same results.

16. In considering the value of the "variolous test" as a proof of the immunity conferred by cow-pox, it must be borne in mind that most of the medical men at the close of the eighteenth century, Jenner included, had very considerable experience of the practice of inoculation; they were familiar with the varying effects of inoculation under different circumstances, from the cases where a genuine development of small-pox with a copious eruption resulted, to the cases where the effect was no more than the normal consequence of a puncture or incision by a clean lancet in the sound skin of a healthy man; they were called upon to decide, in cases giving rise to doubt, whether the effect of the operation had been the conferring of small-pox with the attendant immunity against future attacks, the welfare of the patient in view of subsequent exposure to contagion being dependent on the correctness of their judgment; and, making every



allowance for errors which must necessarily intervene in this as in other human judgments, there can be no doubt, as is pointed out in the detailed discussion of the "variolous test" to be found in the appendix on pages 143-5, that they had by experience learnt to know as a general rule whether or not the operation had so far produced the effects of small-pox as to confer the desired immunity. Nor is there any reason whatever to think that their attitude of mind was different when they used inoculation merely as a test of insusceptibility from what it was when they used the operation with the intent to provoke the disease. There does not seem then to be any sufficient ground for regarding the variolous test applied to cases of cow-pox in proof of immunity towards small-pox, as invalid, remembering of course always that in this, as in other things, a sanguine hasty person might be led by the desire of seeing his expectations fulfilled to minimise the effect of the operation; he might be led to overlook results which a more cautious observer would regard as evidence that small-pox had been really produced.

17. It is certain that Jenner believed that those who had suffered from cow-pox, whether naturally or artificially produced, exhibited when the variolous test was applied phenomena similar to those witnessed in the case of persons who had suffered from small-pox, and differing from the phenomena observed in those who enjoyed no kind of immunity or protection. If vaccination be without protective influence this ought not to have been the case. The symptoms should have been those of persons who had not suffered from small-pox and enjoyed no protection against it. If Jenner was an honest witness it is scarcely possible to believe that this was the case. His tests were applied for the very purpose of determining whether vaccination afforded protection. If the results presented were the same as would have been exhibited in unprotected persons it is difficult to conceive that he should have arrived at the conclusion that vaccination secured the same immunity as a previous attack of small-pox. It is true that in exceptional cases persons, who had never suffered from small-pox, showed when tested by inoculation the same absence of definite variolous symptoms as those who had been subject to the disease. These persons were spoken of as "naturally insusceptible" of taking the small-pox. It is just possible that all the vaccinated persons to whom Jenner applied the variolous test were thus naturally insusceptible. But that this should have chanced to be the case is of course in the highest degree improbable.

18. The experiences of Jenner did not stand alone. His results and views attracted great attention, and in the early part of the year 1799 Woodville and Pearson, who were physicians to the Small-pox Hospital in London, commenced making experiments with vaccine matter with a view to ascertain whether it afforded protection against small-pox. They arrived like Jenner at the conclusion that it did.

19. In January 1799 Woodville, having found cow-pox to be present in a "dairy" at Gray's Inn Lane, inoculated seven persons at the Small-pox Hospital with matter from one of the cows at the "dairy," and other persons with matter from sores on a dairymaid employed at the same place who had become infected from the cows. From these cases he inoculated in succession others at the Hospital, eventually to the number of many hundreds, and thus established the stock of what has been spoken of as "Woodville's lymph." Pearson also at the same time occupied himself with the question of inoculation with the cow-pox, writing a pamphlet about it. Woodville and he distributed to many persons in this country and abroad quantities of the lymph from the Hospital; and this was the beginning of the more general practice of vaccination, for Jenner's stock of lymph, the results of which he had described in his treatise, had come to an end.

20. Although Woodville's "Hospital lymph" appears to have been widely distributed by himself and by Pearson, and thus to have been the source of the lymph used in various places in the early days of vaccination, it was not the only source, even in those days. Pearson also obtained lymph from cow-pox at a dairy in the Marylebone Road, and used this "in certain situations," which may be presumed to include places elsewhere than in the Hospital. He also speaks of having obtained lymph from the cow from a third source. Jenner again, who received and used some of Woodville's Hospital lymph, also obtained lymph from some other sources; for instance, from a cow at a Mr. Clark's farm in Kentish Town. Further, Woodville in 1800 speaks of his having at various times procured the vaccine virus as produced in different cows,



which when used at the Hospital produced the same effects as the Gray's Inn Lane lymph. We are not justified in assuming that an account of every new source of lymph was published; and there may have been others, it is impossible to say how many, than those just mentioned. In any case Woodville's Hospital lymph was not the only lymph used in those early days; not only, however, was it largely used (indeed we have no evidence of so widespread a use of lymph derived from any other source), but the use of it marks the definite beginning of the practice of vaccination; and the history of it demands special notice.

21. Of the cases recorded by Woodville in his Reports, the larger number, about three-fifths, presented an important and, as compared with Jenner's cases, a new feature, in that, in addition to the changes taking place at the seat of inoculation and constituting what Woodville called the "cow-pox tumour," which may here be spoken of as the "vaccine vesicle," an eruption over the body of a greater or less number of pustules was observed. These eruptive pustules occurred in the very first cases; of the seven cases inoculated from the cow, four, and of the five inoculated from the dairy-maid, four had such pustules; and their appearance is recorded again and again in the series, down to the case which appears last but one in the tabular statement forming part of the Reports.

Moreover an eruption of pustules is described in certain of the cases of which accounts were published at about the same time by Pearson and many others. In some of these cases the lymph used was supplied from the Small-pox Hospital by Woodville or Pearson.

22. It must be admitted, as will be seen from the detailed discussion which we give in an appendix at pages 145-153, that these pustules were pustules of small-pox, and that, therefore, Woodville's cases, which did so much to establish the practice of vaccination, were not cases simply of cow-pox but of cow-pox mixed, so to speak, with small-pox. It has indeed been maintained that Woodville's cases were not cases of cow-pox at all, that small-pox was inadvertently introduced into the very first cases; that the history of the whole series is the history of a series of small-pox cases putting on special characters, and that therefore the lymph used and distributed by Woodville and Pearson was in reality not cow-pox lymph but small-pox lymph. But a detailed discussion of all the facts such as will be found at pages 145-153, shows this view to be untenable. A review of all the evidence available leads to no other conclusion than that, however much in Woodville's, Pearson's and other cases cow-pox was mixed up with small-pox, the lymph used and distributed by Woodville and Pearson and called by them cow-pox lymph (excluding of course all the cases, of which there were not a few, in which matter was taken not from the local "cow-pox tumour" at the seat of inoculation, but from one of the eruptive pustules) was veritable cow-pox lymph having the true characters of cow-pox lymph only.

23. It of course follows that the cases, both in Woodville's practice and in that of others, in which the inoculation of cow-pox matter was accompanied by an eruption of pustules, due to small-pox being present as well as cow-pox, when appealed to as showing immunity against small-pox (by the test either of exposure to contagion or of inoculation), furnished false evidence as to that immunity being due to cow-pox; it might have been due to the accompanying small-pox. So far then as the adoption of vaccination was assisted by cases of this description, it may be held to have rested on erroneous data.

But the test of immunity, whether that of exposure to natural contagion or that of inoculation, was applied not only to the cases with eruption but to the cases without it, not only to cases where Woodville's lymph was used but to cases where lymph of other origin was used. We have no accurate records enabling us to distinguish these latter cases as regards immunity. Marshall makes a general statement that he found no difference between the cases inoculated with the lymph which we otherwise learn came originally from Woodville's case of Bumpus, and the cases in which the lymph employed was obtained from Clark's farm; but, though we learn from many scattered records that cases vaccinated by different persons showed immunity, we possess as a rule no details enabling us to distinguish the cases in which lymph obtained from the hospital was used from those in which the lymph was obtained from other sources, or indeed between the cases inoculated with lymph traceable to Woodville's earlier cases of Gray's Inn Lane origin and those inoculated with the various lymphs of other origin employed by Woodville. Yet it is clear that no contrast, as regards the immunity



afforded, was presented between the cases where one lymph was used and those in which another was employed, or between those cases in which pustules appeared and those in which they did not. The reality of the immunity, so far as we can tell, was as great in the one class as in the other.

Moreover, admitting the error introduced by the pustular cases, it must be remembered that the error was of brief duration. The pustular cases, relatively numerous, at the outset, in the experience of Woodville and in that of some other observers, soon became exceptional in the experience of all. Within one or two years the error was recognised, and it was generally acknowledged that inoculated cow-pox differed clearly from inoculated small-pox in being as a rule unaccompanied by an eruption of pustules, and especially in not being contagious.

24. The view that cow-pox protects against small-pox thus put forward by Jenner, and supported by Woodville and Pearson, speedily attracted great attention among both the profession and the general public. Controversies, as might be expected, arose both on the main point whether protection was really afforded and on various subsidiary points; but, within a very short time, the new doctrine found general acceptance in England.

In 1800 a declaration of adhesion to the doctrine was issued with the signatures of many of the leading physicians and surgeons of London, and to this in the following year many others added their names. In various large cities the resident medical men made known collectively their approval.

1, App. 94-6.

In 1802 a Committee of the House of Commons made a report on the utility of the discovery of the protective power of cow-pox, and upon Jenner's claim to be considered as the discoverer. A number of witnesses of extensive experience in the profession were examined. It is important to notice that the Committee not only stated the result of the evidence to be favourable to the protective effect of vaccination, but that vaccine inoculation "introduces a milder disorder in the place of the inoculated small-pox, which is not capable of being communicated by contagion."

1, App. 97-9.

25. A few years later, controversies still continuing, the Royal College of Physicians made at His Majesty's command a report on the subject of vaccination to the House of Commons. This report was presented in 1807. The inquiry appears to have been a thorough one. No facts were regarded as proved, but those stated from actual observation. The College was made acquainted with the results of several hundred thousand cases, and the conclusion arrived at was that, though in some instances vaccination failed to protect, it afforded greater security against small-pox than the inoculation previously in use, whilst the illness induced by it was milder and less hazardous. It was further observed that in almost every case where small-pox had succeeded vaccination, whether by inoculation or casual infection, the disease had varied much from its ordinary course; it had neither been the same in violence nor in the duration of its symptoms, but had with few exceptions been remarkably mild. Moreover, it was pointed out that vaccinated persons spread no infection, and that cow-pox could only be communicated by inoculation. The report stated that towns and districts of the country in which vaccination had been general had afterwards had the small-pox prevalent on all sides of them without suffering from the contagion. Although the evidence before the College was not universally favourable to vaccination it was nearly so, and the important statement was made that many who were once adverse to the practice had been convinced by further trials, and were to be ranked amongst its warmest supporters. The College as the result of the inquiry felt it to be their duty strongly to recommend the practice of vaccination.

1, App. 110,  
108.

26. From England the doctrine and the practice of vaccination rapidly spread to the continent of Europe. In Denmark a number of the most respectable physicians of Copenhagen formed themselves, in 1804, into a society to collect and investigate all grounds and arguments for and against the anti-variolous agent proposed by Jenner. A Royal Commission composed of medical men was at the same time appointed to investigate the subject. It is stated that after the lapse of a few years the private committee as well as the Royal Commission, although many of the members had at the commencement entertained a doubt as to the doctrine of Jenner, arrived unanimously at the conviction that vaccine virus was a preservative from small-pox.

In several European countries the utility of vaccination was early recognised by State action of one kind or another. Nor was this confined to Europe. In 1809-10



the State of Massachusetts passed statutes providing for inoculation with the cow-pox and giving power to raise money to pay for the operation. 6, App. 772-3.

Thus the doctrine that cow-pox protects against small-pox found an acceptance in most countries of Europe, and in the New World as great as it did in its birth-place, England. And without insisting too much on authority we may at least say, especially when it is remembered how slow men are to adopt new methods and how much prejudice is apt to exist against a novel treatment which is foreign in its origin, that such a widespread and rapid acceptance of the doctrine, in spite of hostile criticism, which was not wanting, shows that the evidence for it must at the time have appeared very strong.

27. It is impossible to trace with absolute certainty the source of the lymph used on the Continent and in other foreign countries. Pearson claims to have been the chief agent of the first distribution; and probably much, though, as has already been urged, not all, Pearson's lymph came from the Small-pox Hospital. Woodville started vaccination in France presumably with Hospital lymph. Indeed it is clear that in many instances the lymph with which vaccination was started in places abroad was supplied by Pearson or Woodville, and it is probable that much at least of this lymph had its origin in the cases of Woodville at the Small-pox Hospital spoken of above. But it is at the same time also clear that foreign observers obtained lymph from others than Pearson or Woodville. We learn that Jenner, who naturally was much appealed to for supplies of lymph, himself sent lymph to Stromeier of Hanover (*Med. Phys. Jl.*, III., 471), to De Carro of Vienna (*Baron*, I., 348), to Berlin (*Baron*, I., 348), to Waterhouse in America (*Baron*, I., 439), to Barbadoes (*Baron*, I., 533), and to Newfoundland (*Med. Phys. Jl.*, V., 340); he may have sent lymph to other places, but his having done so does not seem to be recorded. Again, lymph derived from supplies originally obtained from Jenner, and sometimes spoken of as "Jenner's lymph" or the "stock of Jenner," was sent abroad by several persons. Thus Waterhouse's first supply of lymph came through Haygarth from Creaser of Bath, "whose stock was produced from the stock of Jenner," and Ring states (*Treatise*, page 20) that he distributed to "various parts of Europe and America" lymph derived from a supply sent to him by Jenner through Paytherus. Lymph from Jenner, "Jenner's lymph," must have been largely used abroad.

The lymph used by Jenner in those early days of vaccination was of two sources; that sent to him by Woodville, taken from the case of Bumpus at the Small-pox Hospital, and that obtained through Tanner direct from a cow at Clark's dairy-farm in Kentish Town. (Somewhat later he made use of another stock also furnished him by Tanner and supposed to be of equine origin.) We know of one instance in which he sent out lymph of the first of the above two strains, Woodville's lymph; he sent it to Ring, in whose hands it failed (*Baron*, I., 358), and he may have sent it to others. But he certainly also largely used and distributed the Clark's farm lymph (*Baron*, I., 343; *Crookshank*, II., 258); he sent some of it to Woodville, who used it at the Small-pox Hospital. "Jenner's lymph" was certainly in part at least, probably largely, lymph derived from Clark's farm.

We do not know how far Jenner's lymph was successively carried on by the recipients abroad. Stromeier (*op. cit.*) gave up the use of the lymph sent to him by Jenner, preferring that sent by Pearson; but at Berlin the use of Jenner's lymph seems to have been continued. The lymph sent to Waterhouse by Haygarth, though apparently successful at first, became useless later on; according to Waterhouse this was due to careless and ignorant management. Of the later supply sent by Jenner himself no such complaint is recorded, and this probably, together with that sent to Waterhouse from Ring which also was "Jenner lymph," continued to be used in Massachusetts; though it is impossible to separate the use of this lymph from that of the lymph received by Waterhouse from Woodville and Pearson (which was probably "Hospital lymph") and from Lettsom (*Baron*, I., 471).

Unless we are prepared to assume (1) that all the lymph distributed abroad by Pearson and Woodville was derived from Woodville's original cases, and none of it from the other sources used by Pearson and even by Woodville himself; (2) that all the "Jenner's lymph" sent abroad by Jenner himself or by others was derived from the Hospital lymph sent to Jenner by Woodville, and none of it from the Clark's farm lymph, which Jenner used and distributed so largely; or (3) that all the Clark's farm strain sent abroad failed or was discontinued, the lymph of Hospital source alone maintaining its position; we must conclude that the lymph by means of which vaccination was established abroad was not exclusively that derived from Woodville's



original cases. For such assumptions there is no positive evidence at all, and probabilities at least are entirely against them. Further, all the lymph employed abroad in the early days of vaccination did not come from England. Sacco, for instance, discovered natural cow-pox in Lombardy, and both he and De Carro, of Vienna, made large use, with positive results, of the lymph obtained from this source; its effects were identical with those of the lymph obtained from England, *i.e.*, from Woodville or Jenner. This Lombardy cow-pox is stated by De Carro to have been the origin of the lymph which he sent to Constantinople, and which started vaccination in the East. (*De Carro ; Histoire de la Vaccine* 1804, page 23, *et seq.*)

Whatever may have been the case in the first instance as regards Woodville's and Pearson's lymph, it seems impossible to believe that the virus generally used in the early part of this century, whether in this country or elsewhere, was small-pox, and the process the old and well-known one of inoculation with that virus. If the evidence of the protection conferred by cow-pox be numerically lessened by some of the early supposed cases of cow-pox being really cases of small-pox, it is strengthened qualitatively by the absence of any contrast as to the immunity conferred between those who had been given cow-pox only and those who had been given small-pox as well or instead.

28. The data available for determining to what extent vaccination was practised in England in the first quarter of the nineteenth century do not permit of any exact numerical statements being made, but they at least show that the amount was considerable. Woodville, Pearson, Jenner himself, and others distributed virus to various practitioners all over the kingdom, and contemporary writings show that in the years immediately succeeding the publication of Jenner's treatise vaccination was practised with enthusiastic activity. The operation was repeatedly performed not only by doctors but by persons outside the profession; by clergymen and others, and even by ladies, as an exercise of benevolence. All this activity must have led in a few years to the vaccination of a considerable proportion of the population; and Jenner, writing in 1801, says that at the lowest computation some 100,000 of the inhabitants "within these realms" had already been vaccinated. A little later the number was spoken of as several hundred thousands.

29. Beyond such general statements, however, one cannot go. Records exist, it is true, up to about the year 1807 of the numbers vaccinated in certain large towns in England, and there are also records of the numbers vaccinated during the first quarter of the century at the institutions established in London for the vaccination of the poor. But these hardly do more than support the general statement that vaccination was largely practised. An attempt has been made to calculate, upon the basis of the returns of the above institutions, the proportion of the population in London which was vaccinated during the first twenty years or so of the century; but the data are too uncertain to allow of any value being attached to the result.

30. Incidental references in contemporary writings seem to show that, after about 1805, the first enthusiasm for vaccination somewhat diminished and the practice tended to decrease; but the check seems to have been transient only, for such scattered data as can be obtained show that the practice was very prevalent during the latter part of the first quarter of the century. This is strikingly illustrated by two records, one in London, the other in the country.

Of the children (over 8,000, all under 12 years of age) admitted into the Royal Metropolitan Infirmary between October 1820 and April 1822, 41 per cent. had been vaccinated, and 6 per cent. inoculated.

At Cambridge in 1824 of the 8,112 inhabitants under 25 years of age (who had been born therefore since the introduction of vaccination) 48·7 per cent. had been vaccinated.

At Norwich, in 1819, it was calculated that out of a population of 40,000 about 10,000 had been vaccinated; but there is no statement as to the ages of the vaccinated. The distribution of the vaccinated was irregular, for of 603 persons forming families specially examined only 91 had been vaccinated, and of these only 57 previously to 1819.

There are no reasons for thinking that, so far at least as towns are concerned, Cambridge was in any way exceptional as regards vaccination. On the other hand, the great similarity of the results in places so different as London and Cambridge, go far to justify the supposition that, could data be obtained, they would show a like state of things in the towns generally. If so it may be concluded that at the end of the first quarter of the nineteenth century, at any rate in towns, a proportion approaching the half of the children born during that quarter were vaccinated. As



to the vaccination of those who were adults at this period, hardly any information exists, but incidental references show that at least in the early days of vaccination many adults were vaccinated. To the number of the vaccinated young there must therefore be added an unknown number of persons vaccinated in adult or advanced life. No statistical information is available to show whether the state of vaccination in rural districts differed, and if so to what extent, from that which prevailed in towns.

31. Passing to countries other than England, Sweden deserves attention on account of the relatively complete records existing there. These give not only the population, the births, the total deaths, and the deaths from small-pox from the year 1774 onward, but also from 1804 onward the numbers vaccinated. Vaccination was introduced into Sweden in 1801, and in 1816 was made compulsory in so far that a fine was imposed for nonconformance. In 1804 the number of vaccinations during the year amounted to a third of the number of births, and after some fluctuations in succeeding years reached, in 1825, 70 per cent. of the births. Small-pox was very prevalent in Sweden during the latter part of the eighteenth century and the year 1800 had been marked by a most severe epidemic. Hence a large proportion of the population at the introduction of vaccination had had the small-pox and would consequently not be vaccinated; the vaccination during the nineteenth century would fall chiefly on those born during that century; and the near approach of the number vaccinated to the number born shows that a very large proportion of the total population not protected by previous small-pox was vaccinated. 6, App. 752.

32. In Denmark, into which vaccination was introduced in 1801, being made compulsory in 1810, similar records exist, and here the number of those vaccinated more closely approaches, and in some years even exceeds, the number of births; so that a still greater proportion of the population, not protected by previous small-pox, was vaccinated. 1, App. 110, 108.

33. If vaccination have the protective influence alleged, in view of the extent to which we have shown that it was practised in the first quarter of the present century, its fruit ought to be seen in a diminution of the mortality from small-pox during that period. This brings us to the second of the two questions which we have said presented themselves: Does the history of small-pox mortality since vaccination was introduced afford warrant for a belief in its protective effect? This, of course, involves an inquiry into any other possible causes affecting the amount of small-pox mortality. We enter then upon the first stage of this inquiry, confining our attention for the present to the period we have indicated. *Does the history of small-pox mortality since vaccination was introduced afford warrant for a belief in its protective effect?*

34. It becomes necessary at the outset to consider the subject of small-pox mortality and its prevalence prior to the introduction of vaccination, and especially during the latter part of the eighteenth century, the period immediately prior to its introduction. *(i.) The period 1800-1825.*

35. The early history of small-pox, like that of many similar diseases, is obscure, is subject to much debate, and, save perhaps on one point, is of antiquarian interest only. The records of the eighteenth century show that the disease was very prevalent in western Europe during the whole of that century; we shall discuss the history of the disease during that period in some detail presently. The records of the seventeenth century also show that small-pox was a very common disease during that century; this is especially the case as regards the latter half of the century. The statistics which exist with respect to Geneva, and various scattered statements, further show that small-pox was a well-known disease in the sixteenth century, but except for the records which are said to exist of severe epidemics in Iceland taking place as early as 1241, as we go further back the evidence as to the existence of the disease becomes less and less clear, and indeed debateable, depending as it does largely on the interpretation of incidental statements in various medical and other writings. There seems, however, to be adequate proof of the prevalence of small-pox in the East, in Asia Minor and other countries, even in the earlier centuries of the Christian era. 1, App. 109-10.

A view very generally taken teaches that small-pox, introduced from the east, began to be common in western Europe during the fifteenth century, though perhaps existing still earlier, that it increased during the sixteenth and seventeenth centuries, especially the latter, and that it was very prevalent during the eighteenth century. It will be desirable not to discuss this view at length, but to confine our attention to the history of the disease in the seventeenth and eighteenth centuries.



36. In dealing with the eighteenth century it must be borne in mind that during the second half of the century the natural conduct of small-pox, as we shall see later on, was modified by the practice of inoculation, that is, by the artificial giving of the disease by the introduction of the virus through a wound in the skin; but it will be convenient to consider in the first place the century as a whole, and to discuss later on the effects of the practice of inoculation.

37. Our knowledge of the history of small-pox in western Europe during the seventeenth and eighteenth centuries is very largely based on the official records known as the "London Bills of Mortality." Official records bearing on small-pox are furnished by Geneva, going back as far as the sixteenth century, by Sweden, going back to the year 1749, and by some other places. Data are also furnished, especially for the latter part of the eighteenth century, by parish records in various parts of Great Britain reaching over a variable number of years as well as by scattered statements in various works. But it is chiefly to the London Bills of Mortality that appeal is made for support to the different views maintained as to the behaviour of small-pox during the period with which we are dealing.

38. These Bills, which when established were issued weekly, with a general *résumé* at the end of the year, purport to give an account of all the burials and christenings taking place in certain enumerated parishes within and without the walls of the city and also within and without the "liberties." The earlier Bills, issued before the year 1629, gave only the total deaths and the deaths from plague; but from 1629 down to 1845, with a gap from 1637 to 1646 (both years included), the causes of death, including small-pox, are specified. From 1629 to 1636 and from 1647 to 1686 inclusive, the entry is for "flox and small-pox," and from 1687 to 1700 inclusive measles are included with "flox and small-pox." These Bills accordingly afford data of some value for judging of the effects of small-pox in London from 1629 to the close of the eighteenth century and beyond.

39. Their value, however, for exact purposes will be seen to be diminished when the following considerations are borne in mind:—

The Bills record not all the deaths taking place within the area of the Bills, but only those made known to the parish clerks in view of burial in the parish churches. Hence the deaths given in the Bills must always have been less in number than those actually taking place. For, on the one hand, it was a not uncommon practice when a person died in London for the corpse to be taken into the country for burial, and, on the other hand, many Dissenters and many Catholics were buried elsewhere than in the Church of England burial grounds. But it is not possible to ascertain how many deaths there were thus in excess of the deaths recorded in the Bills; and, what is a matter of no little moment, this excess probably varied considerably from time to time.

Even if we accept the record of the deaths recorded as approximately correct, this cannot be trusted implicitly to yield exact conclusions as to the mortality from small-pox, since the population of the area covered by the Bills is not known with certainty. Further, when one period is compared with another, a difficulty is introduced by the fact that from time to time fresh parishes were added to the area from which the Bills were gathered. Then again, it must be remembered that even at that early time, as now, the population of London differed from an ordinary population, from that for instance of a country district, inasmuch as it was not so largely determined by the relation of the births to the deaths. A large number of persons, chiefly adults, were continually entering into and taking up their residence in London, and in like manner a large number of adults were for one reason or another continually leaving it. It has been calculated that in 1685 the population within the Bills of Mortality was 530,000, and in 1750, 653,900; but it is obvious that such calculations can have an approximate value only. In 1801, the population was ascertained by census to be 746,233.

It may be added that the women searchers, "ancient matrons" of low estate and uneducated, were directly responsible for the statements as to the cause of death. Though these women were probably guided in their statements by the opinions of the doctors attending the cases, or by the reports of such opinions, they must have given rise to much error. In the case of death from small-pox, however, there was in all probability less liability to error than in some other diseases.

40. Quite apart from all calculations, the Bills clearly show that from 1629 onwards, throughout the remainder of that century and the whole of the next, very many per-



sons died in London from small-pox. During the latter half of the seventeenth century the yearly deaths fell below 500 on eight occasions only. The return of one year, 1666, conspicuous for the smallness of the number of deaths, 38 only, is intelligible when it is remembered that this is the year succeeding that of the Great Plague. The Bills also show that in both centuries the disease had an epidemic character, the returns of certain years being much greater than those of others. In many instances the epidemic increase is marked in one year only, the returns of the succeeding year being, as a rule, low, but not unfrequently the epidemic lasted over two or more years; and this appears to have occurred more frequently in the eighteenth than in the seventeenth century. Indeed, the variations of the numbers are, as a rule, more abrupt in the latter than in the former period.

41. When we turn to the important question of the mortality from small-pox, that is to say, the proportion of deaths to the number of persons living, we are met with the difficulty of the population not being exactly known. As already stated, it has been calculated that the population in 1685 was 530,000. On the basis of this datum, the average yearly death-rate of, or *mortality* from, small-pox in the ten years around this date, namely, in the years 1681-90, was 3·139 per thousand; the mortality from all causes of death being 42·2 per thousand. Similarly in the ten years 1746-55, on the calculation that the population in 1750 was 653,900, the yearly mortality from small-pox was 3·044; that of deaths from all causes 35·5 per thousand. Taking the same calculations as to population we find that in years when the deaths from small-pox were very high, the mortality from small-pox, both in the seventeenth and eighteenth centuries, was frequently 3, 4, 5, or even more per thousand. Even if we take the years in the eighteenth century in which the returns of deaths from small-pox were the lowest, viz., 1702, 1753, 1782, we find, still using the above calculations, the mortality from small-pox 0·6, 1·2, and 1·0 respectively, and in 1797, using the census of 1801, the death-rate was 0·7. And in most of the years of that century the mortality from small-pox was either not far below, or very distinctly above, 2 per thousand. All this means, even when every allowance is made for the insecurity of the calculations, that the mortality from small-pox in London was, during the eighteenth century, very high. This is a broad conclusion which may be considered as definitely proved.

42. It is further confirmed by the indirect measure of the mortality of small-pox which is offered by the proportion of deaths from this cause to deaths from all causes. This has the value of being independent of the actual population; and, so far as can be judged, is not vitiated by the record of the small-pox deaths being influenced by anything which did not also influence the records of the other deaths. On the other hand, its value is very largely lessened by the fact that the ratio is determined and influenced by circumstances affecting other diseases and not small-pox itself. It may, however, be trusted so far as to show that the ratio during the seventeenth and eighteenth centuries was very high, and, on the whole, higher during the eighteenth than during the seventeenth century. Further, if we assume, as we have probably the right to do, that the total death-rate was during those centuries very high, as compared, for instance, with the present time, we may infer that the death-rate from small-pox was very high, and the disease either very fatal or very prevalent.

43. The Bills give no information whatever about the number of persons attacked by the disease, and therefore teach us nothing as to the *fatality* of the disease, that is to say, the proportion of deaths to the number of cases attacked. We learn, however, by the incidental statements of various authors, that the fatality varied very much in different years, that is, in different epidemics. An epidemic was often spoken of as being either mild or malignant; in some epidemics, though many might be attacked, the proportion of those who died was small; in others the disease proved fatal to a large number of those attacked.

44. Although from 1728 onwards the Bills give the ages at death, the numbers have not been analysed so as to show the "age incidence," of the small-pox mortality, that is to say, the relative mortality at different ages. And the Bills furnish no data for determining how such influences as those of station in life, sanitary conditions, and other circumstances affected the mortality.

45. These Bills of Mortality form, as we have said, by far the most complete source of our knowledge of small-pox in England in past times; but it must be borne in



mind that in respect to any contagious disease like small-pox the conditions of London were peculiar. The population was to a marked extent a moving one; a large number of persons were continually entering London or leaving it, were passing to and from it, from and to the provinces of England and other countries. Of these persons some, coming from infected districts, brought into London fresh sources of contagion; others again, coming from districts free from small-pox, and never having had the disease, brought into London fresh material to serve as food for the disease. Further, London presented in an exaggerated degree the two features of a great city which have a great influence on the progress and characters of a contagious disease like small-pox. The crowding both of the dwelling-places and the thoroughfares, as well as the movement continually going on, multiplied the opportunities for the spread of disease, and the accompanying insanitary conditions, as well as the greater inducement to irregular living, tended to increase the severity of the disease when taken, and to heighten the mortality from it. The history of small-pox in London must not be taken as representative of the history of small-pox in England generally.

46. Apart from the London Bills of Mortality, our information concerning small-pox in England in past times is limited to the records of various scattered places, records confined in most cases to short periods, chiefly in the middle or latter part of the eighteenth century, or to incidental accounts and remarks. From these it would appear that in some places and at times small-pox was exceedingly prevalent, and at other places or at other times at least rare if not exceedingly so.

47. A valuable and instructive record is that given by Haygarth of an epidemic of small-pox in Chester in the year 1774. Out of a population of 14,713 there occurred during the year 1774, 1,202 cases of small-pox, of whom 202 died. On the 1st January 1775, it was ascertained that 1,060, that is about 7 per cent. of the population, had not had the small-pox during the previous year or at any earlier time. This was after the epidemic which, as the figures showed, was severe; before the epidemic, on the supposition that none of those who took the disease in 1774 had suffered from it before, the numbers who had not had it on the 1st January 1774 were 2,262, or 15 per cent. of the whole population, and of these more than half were attacked before the end of the year. Although experience shows that the hypothesis that none of those who were attacked in 1774 had previously suffered from the disease is not likely to be accurate, it shows also that the number of those who suffered a second time is not likely to have been so numerous as seriously to affect the calculation.

A record exists of an epidemic at Warrington in 1773. In a population estimated at 8,000 there were, during that year, 211 deaths from small-pox. The deaths from all causes during the same period amounted to 473.

Again, in the small town of Ware in 1722, out of a population of 2,515, at the beginning of the epidemic, 1,601 had previously had the small-pox; leaving 914 susceptible persons. Among these there were during the epidemic 612 cases with 72 deaths, leaving at the end of the epidemic, 302 persons who, having escaped the attack, are spoken of in the record as "to have the small-pox."

48. These records do not merely show the severity of the epidemics with which they deal, comparable with those of London, but those of Chester and Ware also show, what is much more important, how small a portion of the population in such places had not suffered from small-pox at some time or other. They show that in a provincial city and in a small agricultural country town there were epidemics of small-pox during the period with which we are dealing comparable with those disclosed by the London Bills of Mortality. There is no reason to think that the condition of things in Chester or in Ware was exceptional; it may probably be taken as illustrative of like towns elsewhere.

49. On the other hand, there is evidence that in the eighteenth century in some districts of England small-pox was very rare. Thus in three small rural parishes in Kent with a united population of 1,088 there were recorded during 20 years in the latter half of the century only 10 deaths from small-pox.

There are no means of ascertaining to what extent a like paucity of small-pox existed in other rural districts of England. Haygarth, in referring to the rural parishes just quoted, states it as his opinion that in his own neighbourhood such a freedom from small-pox was unknown, and was probably so wherever inoculation was practised.



50. In one respect the provinces differed from the metropolis. In London, as we have seen, small-pox was always present during the eighteenth century; though in some years the deaths from small-pox were more numerous than in others, a large number died every year; even in the years quoted above as yielding the lowest returns, the yearly number of deaths is still considerable. In the provinces, as is shown by records and numerous incidental statements, the disease had a more distinctly epidemic character, especially in towns other than the great cities and in rural districts. Thus in the small parish of Kilmarnock the records show that the small-pox was severe every few years, between which there were no deaths at all from small-pox or very few only. Hence we may conclude that though in the districts where for one reason or another epidemics did not make their appearance, as in the Kentish rural parishes, the mortality from small-pox was low, yet where epidemics did make their way the prevalence of small-pox was great and the mortality from it high, comparable indeed with that of London.

Q. 24,823,  
24,979.

51. Records exist of the deaths from small-pox in the times previous to the nineteenth century in countries other than England. Thus, in Sweden records from 1774 to the end of the century (and beyond) give both the population and the deaths from small-pox. (The records go back to 1749, but up to 1774 the deaths from small-pox and measles were not distinguished.) These show great variations in the yearly mortality from small-pox. In some (epidemic) years, the mortality was very great, greater even than that of London, as calculated from the Bills of Mortality in the manner described above; on the other hand in many years the mortality was much lower than that ever reached in London during the same period. In Sweden as a whole, as in the provinces of England, the disease had a very marked epidemic character. Similar records relating to Copenhagen and Geneva, the last reaching back to 1580, and other places, all confirm the conclusion as to the great prevalence of, and high mortality from, small-pox in Western Europe during the eighteenth century and earlier.

6, App. 752  
1, App. 112.

1, App. 107.

52. But perhaps the most striking evidence in favour of this conclusion is to be seen in the fact that the chance of taking the disease and of dying from it was made the subject of mathematical treatment by distinguished mathematicians of the time. Thus Daniel Bernouilli, writing in 1760-5, takes as one of the bases of his calculation the datum (arrived at by means of various records in various places) that small-pox carries off the thirteenth or fourteenth part of each generation; or in other words, that the deaths from small-pox are about one-thirteenth or one-fourteenth of the deaths from all causes. The same author uses another datum obtained in a similar way, namely, that the eighth or the seventh part of those attacked die of it. From this, it follows that something like 40 per cent. of those born died without having small-pox. Since of these so dying a large number died at an early age, the number of those dying in adult and in advanced age without ever having had the disease would be much less. And in this sense, probably, must be read the statement of Haygarth, which he gives without supplying the data on which it is based, namely, that "some persons are incapable of infection by the small-pox. The proportion of mankind thus exempted has been observed to amount to 1 in 20"; that is to 5 per cent. The persons here referred to are probably those who lived to an advanced age without taking small-pox, though exposed to infection and possibly (for Haygarth wrote in the inoculation period) subjected to inoculation.

That Bernouilli should use data like the above for an elaborate work, and that a careful observer like Haygarth should make such a statement as that above quoted, emphasizes the conclusion as to the great prevalence of small-pox in the times in question.

53. We may pass now from the mere prevalence of or the mere mortality from small-pox to its fatality in those days. Much controversy has arisen on this point, and much has been made of the statistics of Dr. Jurin on this head. The returns furnished to him of the number of cases attacked, and of the number of deaths of those attacked, during epidemics in various places in England and America, showed an average rate of fatality of 16.5 per cent. amongst those attacked. This, which does not differ much from the datum employed by Bernouilli, has been put forward by many as being about the natural fatality of small-pox during the 18th century. It has been urged that the deaths of those dying under two years of age were excluded from Jurin's statistics, and that this must have led to the omission of many deaths, as the mortality in that class was high. The evidence relied on to show that cases



under two years of age were excluded certainly cannot be regarded as establishing it. It is to be observed that although the average fatality in what are known as Jurin's cases was only 16·5 per cent., the fatality in the various epidemics from which those statistics were compiled varied greatly, ranging from 10 to 36 per cent. There are instances where the fatality has been even less than 10 per cent. As has been already remarked, the fatality of small-pox differed very greatly in different epidemics. Bernoulli, in taking the average fatality quoted above, remarks on its great variability, it may be as high as 1 in 3 (and indeed still higher results have been recorded), or as low as 1 in 40. The records of the London Small-Pox Hospital from 1746 to 1763 showed a fatality of 25·3 per cent., and it has been stated that during the last 25 years of the last century 32 per cent. of those admitted succumbed to the disease. In the Bill of Mortality of the town of Warrington for the year 1773, by the Rev. J. Aikin, communicated by Dr. Percival to the Royal Society of London, it is stated that in one neighbourhood, out of 29 who had the disease 12 (that is to say, 41·3 per cent.) died. He states, further, that in other neighbourhoods the fatality was still greater, and that he had reason to believe that it was not less on the whole. There can be no doubt that the fatality of small-pox differed very greatly in different epidemics. So great are the variations that only very large numbers would justify an average being accepted as showing what may be called the normal or natural fatality. It is much more important to bear in mind that the fatality differed widely on different occasions.

54. One character of the small-pox in the eighteenth century (and there is nothing to prove the state of things before the eighteenth century to have been different) is brought out in all the records in which the ages are given, namely, the large proportion of the deaths contributed by the very young. Thus in Chester, in the epidemic of 1774, all the 202 deaths were of those under 10 years, and a quarter of them under one year. In Warrington in 1773, all the deaths were of those under nine years. In Kilmarnock, of the 622 deaths occurring between 1728 and 1763, the ages of nine not being given, only seven were of those above 10 years. The burial registers for the graveyard of St. Cuthbert's, Canongate, and Buccleuch Street, Edinburgh, show that during the years 1764-83, the proportion of deaths from small-pox of those below the age of ten years, to every thousand deaths from that disease at all ages, was 993. Indeed in all records of epidemics in which the ages are given, the mortality was mainly amongst infants. It is also seen in the larger records, covering periods including both epidemic years and years which were not epidemic, as in those of Geneva (1580-1760), which show that the feature was apparent earlier than the eighteenth century, in those of Sweden (1774-1800) and in those of other places. Incidental references in various writings show that the fact was recognised at the time; thus Haygarth observes that in Chester in the years 1772-1777, of those under 10 years, "half as many die of the small-pox as of all other diseases"; and this feature of small-pox is assumed in the calculations of Bernoulli referred to above.

55. The first quarter of the 19th century was characterised in this and other countries by a striking decrease of small-pox.

56. In the London Bills of Mortality the returns of small-pox for the year 1800 are 2,409. This was the last return so high as 2,000. From thence onward the number of deaths from small-pox fell, especially after 1810, reaching in 1818 so low a figure as 421; the fall being irregular and marked by epidemics as in 1812, 1817, and 1825. This decline is all the more striking since during this period the population of London within the limits of the Bills, increased from 746,233 in 1801 to 1,180,292 in 1831. As has been already urged the Bills were imperfect, and there is ground for believing that during this quarter of the century the imperfections were greater than in former times. This is confirmed by the fact that the returns of the total deaths, in spite of the increased population, were on the whole not greater, in many years even less, than in the preceding century. Making every allowance for the effects of improved sanitary conditions, this feature of the returns may be taken as evidence of their imperfection. Still, in spite of their imperfect character, the Bills show that during this quarter of the century, a striking change took place in small-pox in London.

57. Adequate records of the prevalence of and mortality from small-pox in parts of England other than London, during the first 25 years of the nineteenth

Q. 24,823,  
24,979.

6, App. 642.

1, App. 76.



century, are not available; but that in the provinces, as in London, a very great change had taken place is shown by comparing the condition as regards small-pox of towns at, or towards the end of, this period with that of towns during the last century.

In Cambridge, with a total population of 14,142 in 1821, the number of persons who, up to the summer of 1826, had had small-pox during the preceding 25 years was 3,560, or about 25 per cent. These figures result from the answers given to inquiries in a house-to-house visitation, and being dependent on the memory of those interrogated can have only an approximate value. Moreover, they of course omit all who had small-pox anterior to the 25 years. On the other hand, a severe epidemic of small-pox took place in Cambridge in 1823-4, and the deduction of the 686 cases of that epidemic from the numbers above, reduces the per-centage to about 20. The population born during the above 25 years amounted to 8,112; of these 34·4 per cent, had had small-pox, 12·7 per cent. by inoculation.

In Chester, of which previous mention has been made, with a population in 1774 almost the same as that of Cambridge in 1821, viz., 14,713, by the 1st January 1775 all but 1,060, that is about 93 per cent., had had small-pox at some time or other. The year 1774 was marked by a severe epidemic of small-pox, the number of cases being 1,202; hence of the population on the 1st January 1774, all but 2,262, or about 85 per cent., had had small-pox.

Again in Ware in 1722, of which mention has also previously been made, of a population of 2,515 all but 302, or about 82 per cent., had had small-pox. That, again, was after an epidemic, of 612 cases; so that the per-centage before the epidemic was about 64.

Data, more fragmentary, exist concerning Norwich in 1820, which city with a then population of about forty thousand had had epidemics of small-pox in 1805, in 1807-9, in 1813, and in 1818-9; the last being very severe, the deaths for the year 1819 being 530, a mortality of about 13 per thousand. Mr. Cross (*History of a Variolous Epidemic*, page 38) states that visiting 500 families, with 1,377 persons under twenty years of age, he found that 715 (or more probably 726), i.e., about 52 per cent., had had small-pox. But of these 357 (more probably 368) had had the disease during the recent epidemic, and 358, or about 26 per cent., had had it earlier. He further states that of 603 persons, forming the 112 different families in which the 200 cases of small-pox which came under his notice during the epidemic occurred, 497 (or roughly 70 per cent.) had had the small-pox at some time or other. Of these 297 (or about 50 per cent.) had had the disease previous to the epidemic. No mention of age is made in the latter statement, and the former statement probably gives a more correct idea of the general condition of the city. If so Norwich did not differ as to its condition in regard to small-pox very widely from Cambridge, and like it presents a contrast to Chester, not so striking a one, but still instructive, since Norwich in the first quarter of the present century, like Chester in the last century, suffered from severe epidemics of the disease.

58. The data of the two epochs are not exactly comparable; though, from what has been stated concerning the age-incidence of small-pox in the eighteenth century, the greater part of those who suffered in Chester and Ware had probably had small-pox within the previous 25 years. Moreover, the data in any case are approximative only. Still, making every allowance, the contrast between the two epochs confirms the conclusion as to the decline of small-pox in the provinces in the first quarter of the nineteenth century.

59. If leaving England we turn to other countries, to Sweden for instance, in which 6, App. 752. as has been seen records more exact than those in England exist, the same marked change is apparent, indeed is still more clear. As has already been stated, the small-pox mortality in Sweden from 1774 to 1801 was very high, comparable to that of London, though more strongly marked by epidemic variations. This state of things 1, App. 112. is shown as far back as 1749, but less exactly on account of measles and small-pox being returned under the same head between 1749 and 1773. In 1800, a great epidemic year, the mortality was over 5 per thousand, and the yearly average of the period 1774-1801 was over 2 per thousand. From 1801 onward there is a fall, becoming great after 1809; the yearly average reaching 1 per thousand in one year only, 1809, falling after 1816 often below 0·1 per thousand and, indeed, in one year reaching 0·04 per thousand, but rising again to nearly 0·5 per thousand in 1825.

60. A similar change is shown by the exact records of Copenhagen which 1, App. reach back to 1750. Small-pox was prevalent up to 1801, then suddenly declined. 107-8.



Indeed for a while it quite disappeared, no deaths being recorded between the years 1810 and 1824.

61. And a similar change is seen in such records as are available relating to other countries of Western Europe and to the United States. In all cases the first quarter of the new century is marked by a great diminution of small-pox deaths.

62. What was the cause, or what were the causes, of this marked decline of small-pox in the first quarter of the nineteenth century? Was it due to the introduction of vaccination, or is it to be otherwise explained?

63. One effect of the introduction of vaccination was a very great decrease in the practice of inoculation, which had become very prevalent during the later part of the previous century. And the view has been put forward that, the prevalence of inoculation having greatly increased the amount of small-pox, the diminution of small-pox in question was the result of the decrease of inoculation.

64. The practice of inoculation for the small-pox, that is the artificial introduction of the virus into the system by the insertion of fluid from a variolous pustule into wounds of the skin made for the purpose, began definitely in England towards the end of the first quarter of the eighteenth century. Attention was directed to the matter by letters from Timoni of Athens (dated 1713) and Pylarini, published in the 29th volume of the Philosophical Transactions (1716), and especially by a letter from Lady Mary Wortley Montagu in 1717. Though there are indications that in Great Britain and Ireland, as in other countries, some sort of inoculation had occasionally been practised at a much earlier date, the first clearly recorded case in England is that of the daughter of Lady Mary Wortley Montagu (whose son had some time before been inoculated at Constantinople), inoculated by Maitland, in London, in April 1721. Other cases soon followed in England, and about the same time the practice was also introduced in other countries of Western Europe, and into the United States of America, namely, at Boston.

65. It was found that the attacks induced by inoculation were as a rule milder, and very much less fatal than the attacks of the "natural" disease, the fever and constitutional disturbance being less and of shorter duration, and the eruptive pustules much fewer; the number of these varied, being commonly a dozen or two, sometimes only two or three, sometimes a hundred or more. In some cases there was no eruption at all, the effect being limited to constitutional disturbances and to changes in the wounds of inoculation themselves; it was maintained that in such cases the disease had really been taken, and immunity against a subsequent attack secured, as in cases of natural small-pox or of inoculated small-pox manifesting itself in an eruption of pustules.

66. In England the practice of inoculation at its introduction, though much lauded and strongly urged by some, was bitterly opposed by others. Moreover, the initial enthusiasm in favour of it soon declined, so that in the years 1730-40 very little inoculation seems to have been practised. About 1740, however, a revival appears to have taken place; in 1746 an Inoculation and Small-pox Hospital was started in London; and during the whole of the latter half of the eighteenth century the practice may be said to have been very general. It was especially so during the last quarter of the century, the increase being at least largely due to the "improved methods" of inoculation introduced by one Sutton in 1763, and known as "the Suttonian method."

67. This method, carried out by Sutton himself and his immediate associates, as well as in a more or less modified form by Dimsdale and others, had for its object the securing that the attack induced by inoculation, while remaining a veritable attack of small-pox and so bringing immunity against future attacks, should be as mild as possible; that the constitutional disturbance should be slight and of short duration; that the eruptive pustules should be few, or even absent altogether; and that a fatal issue, the somewhat frequent occurrence of which had in the early days been a great obstacle to the spread of the practice, should be rendered at least very rare indeed, if not impossible. Concerning the essentials of the method, which Sutton attempted to keep a secret, there has been much discussion; they seem to have consisted partly in a



proper care or regimen of the patient before, during, and after the inoculation, partly in the mode of inserting the virus, and partly in making use of the fluid of the variolous vesicle at a relatively early stage.

68. There can be no doubt that between the years 1770-1780 inoculation was very widely practised in England, and there is no evidence to show that any marked decline in the practice took place during the remainder of the century. But the distribution of the practice was very unequal. It was much more common among the rich, or at least, among the well-to-do, than among the poor, though many benevolent efforts were made "to extend its advantages" to the latter. Again, in some districts, as in Essex and Herts, the home of Sutton and Dimsdale, and in Yorkshire, the practice was very widespread. On the other hand, parts of Kent and Sussex are quoted by Haygarth in 1793 as having been practically free from inoculation, and similar statements as to the paucity of inoculation in this or that district are made by other writers of about the same period.

There are no records giving exact information as to the amount of inoculation practised in London, but, seeing that it was favoured by the rich, and that on the other hand opportunities for the poor were afforded by the Inoculation Hospital, we may, perhaps, conclude that the practice was at least very general.

69. What influence, then, had the practice on the prevalence of, and on the mortality from, small-pox, during the latter half, and especially during the latter quarter of the eighteenth century?

70. Since an inoculated person was infectious, each inoculation was a source of danger to those, not protected by a previous attack, who came into the company of, or even near, the inoculated person during the attack; and this danger was increased by the fact that the mild character of the inoculated disease permitted, in many cases at least, the patient to move about among his fellows. Moreover, as Haygarth, himself a zealous advocate of inoculation in a systematic regulated manner, points out, the beneficial results of inoculation had robbed the disease of its terrors to so great an extent that the rich and powerful no longer made the efforts which they formerly did to prevent its entrance into, or its spread in, their neighbourhood, and thus favoured its spread among the unprotected poor; so that inoculation "though eminently useful to the rich appeared to be injurious to the poor." Adding, therefore, together the cases of inoculated small-pox, and the cases of natural small-pox of which the inoculated cases were in one way or other the cause, it seems probable that inoculation did tend to increase the *prevalence* of small-pox; but there are no recorded data to show that this really was the case, and this supposed influence may have been counter-balanced by other influences.

71. The evidence as to the influence which inoculation had on the mortality from small-pox is in many respects conflicting. Haygarth, though he admits that in other parts of the kingdom the practice may have saved many lives, was persuaded that in his own part of England and Wales the deaths by the small-pox had been augmented by it; and he points out that in London, Geneva, and other "towns in different situations and circumstances the mortality from this distemper has increased since the introduction of inoculation." Several writers in the latter part of the last, and the early part of the present, century held a similar view. Other writers, again, opposed this view.

72. Much use has been made of the London Bills of Mortality as bearing on the question. These, as has been pointed out, seem to show, in spite of all their imperfections, that the small-pox mortality in London was greater during the eighteenth than during the seventeenth century; and it has been urged that the increase was, in part at least, or even largely, due to the introduction of inoculation.

The several quarters of the 18th century need, in respect to this point, to be distinguished. During the first quarter there was, broadly speaking, no inoculation at all; the few cases from 1721 to 1725 may be neglected. During the second quarter there was very little inoculation, the practice not beginning really to increase until after 1740. During the third quarter the practice rapidly increased, culminating with the introduction of the Suttonian system in 1763. And the great prevalence of the practice appears to have continued during the whole of the last quarter.

Had inoculation been the main cause, or even a large cause, of the increase of mortality during the eighteenth century, this increase would be expected not to be



prominent until about the middle of the century, to rise rapidly during the third quarter and to be more or less stationary during the last quarter. On the contrary, whether the severity of the disease be judged by the total deaths recorded in the Bills, or by the proportion of small-pox deaths to deaths from all causes, or by the mortality calculated on the supposed number of inhabitants, or by the relative severity, frequency of occurrence and duration of the epidemics, such increase as the Bills show in the severity of the disease during the first quarter, when there was no inoculation at all, and during the second quarter, when there was very little, is as marked as, or more marked than, during the latter quarter, when inoculation was most prevalent. The Bills, therefore, do not show that inoculation was the main, or a large, cause of the greater mortality from small-pox in London during the eighteenth century.

73. It must be borne in mind that inoculated small-pox was on the whole much less fatal than that naturally acquired. The class of inoculated persons may thus have contributed less to the fatal cases of small-pox than if they had been left to the chances of natural contagion.

74. That inoculation might have the effect of diminishing very largely the mortality from small-pox is shown by the records of Boston, U.S.A. In these, the cases of and deaths from small-pox, both natural and inoculated, are given for a series of years; and, the population being known, the mortality can be exactly determined. The diminution both in the whole mortality from small-pox and in the cases of natural small-pox is very great indeed. Making every allowance for greater care being taken in Boston than in London, for instance that the cases of inoculation should not serve as causes of infection, these records afford very strong evidence in support of the view that, on the whole, inoculation did not, at least materially, increase the mortality from small-pox.

75. The general conclusion which may be drawn seems to be that inoculation had a double influence, one favourable, the other unfavourable, as regards small-pox; and, owing to the conflict between these two influences, it produced but little effect upon the prevalence of or mortality from small-pox.

There is no adequate evidence that inoculation did increase the mortality from small-pox. There was certainly, so far as the evidence goes, no such increase of small-pox, coincident in point of time with the increase of inoculation, as to justify the decrease of the latter being considered the main cause of the marked decline of the former. Nor is there sufficient even to show that it was a distinct subsidiary cause.

76. It is to be observed that some opponents of vaccination, whilst insisting that the decline in small-pox mortality in the first quarter of the present century was due to the discontinuance of the practice of small-pox inoculation, have contended that what was supposed to be vaccination during that period was in reality inoculation with small-pox virus. It is obvious that these theories are mutually destructive. If the so-called vaccination was in truth small-pox inoculation and the latter practice increases the prevalence of small-pox, the disease should have increased and not diminished during the period under review.

77. Another view has been put forward attributing the decline in question to the improvement of sanitary conditions.

78. The question how far the behaviour of small-pox in the eighteenth century and earlier was influenced by sanitary conditions, is one rendered difficult by the lack of exact information. We may distinguish between overcrowding as one insanitary condition and all other insanitary conditions, such as lack of cleanliness and the like. *A priori* we should expect that a dense population, especially one of great internal movement, and one in continual interchange with surrounding populations, by offering greater facilities for the conveyance of contagion, would lead to a greater amount of small-pox. London was a conspicuous instance of the above, and the apparent greater prevalence of small-pox in London than in the provinces may be attributed to these causes; but it would appear that the increase was felt, as indeed would, *a priori*, seem probable, rather in the constant presence of small-pox to a considerable amount at all times than in the mortality of the epidemics when these occurred. And the same seems also



to be shown to a less extent in other large cities, such as Liverpool. But in this matter of dense and moving populations the eighteenth century did not differ markedly from the early part of the nineteenth. We might *à priori* expect the other acknowledged imperfect sanitary conditions of the eighteenth century to increase the fatality of, and so to a corresponding extent the mortality from, small-pox; but there is no exact evidence to confirm this supposition. If on the contrary we recognise that in the course of the eighteenth century the general mortality, the relative number of deaths from all causes, went on decreasing, and attribute, as has been done, this decrease to improved sanitary conditions, no like decrease of small-pox took place. Again, the places which were deemed the most salubrious appear to have been visited by epidemics of small-pox as severe as those which fell on unhealthy places. Thus the epidemic in Chester in 1774 was undoubtedly a severe one, and yet Haygarth writes, "The healthiness of Chester," as shown by statistics, "must appear so very extraordinary as to be almost incredible." And in general both the incidence of, and mortality from, small-pox seem to have been far less affected by sanitary conditions than might *à priori* have been expected.

79. It may be urged against the view that the decline of small-pox was due to improved sanitary conditions, in the first place, that, admitting the introduction of sanitary improvements, no evidence is forthcoming to show that during the first quarter of the nineteenth century these improvements differentiated that quarter from the last quarter, or half, of the preceding century in any way at all comparable to the extent of the differentiation in respect to small-pox. In the second place, admitting *à priori* that crowded dwellings tend to increase the liability to contagion, and so the prevalence of the disease, while other insanitary conditions tend in addition to increase the fatality among those attacked, so that insanitary conditions as a whole must tend to increase the mortality from small-pox; no evidence is forthcoming which distinctly shows that the dependence of the prevalence of, or the mortality from, small-pox, on the lack of sanitary conditions, was a feature of the history of small-pox during the eighteenth century.

80. It has, indeed, been urged that the London Bills of Mortality show in respect to the heading "Fevers," a decline during the first quarter of the nineteenth century comparable to the decline of small-pox during the same period; that the former is to be explained by the improvements in sanitary conditions, and that, therefore, the latter is to be explained in the same way.

But it must be borne in mind that while there is no difficulty in recognising and naming the disease small-pox, so that the heading "Small-pox" in the Bills may be taken to have included very few cases which were not small-pox, and to have omitted very few which were; the case is very different with the heading "Fevers," the returns under which were so dependent on diagnosis and nomenclature, that a difference in these respects would produce a large change in the number of cases found under this heading, without any change in the actual disease or diseases themselves. Scarcely any heading in the Bills can be less safely trusted as an indication of the conditions affecting disease.

If we turn to some other diseases, as, for example, measles, we find no trace of the influence of sanitary improvements in the early part of this century as compared with the period preceding it. There was no decline of the mortality from that disease, but on the contrary an increase. Moreover, some of the diseases which contributed to the heading "Fevers" are dependent on sanitary conditions to an extent and in a manner wholly different from small-pox.

We shall return to this question hereafter, and discuss more fully the influence exercised by sanitary changes upon the mortality from small-pox.

81. Moreover, it must be remembered that the decline in small-pox mortality was observed in Western Europe in countries where the sanitary conditions were widely different. Whatever may have been the sanitary improvements during the first quarter of this century in England and some other countries, there seems no ground for supposing that throughout Western Europe the period was marked by great changes in the direction of improved sanitation. Indeed, in many countries down to a recent period, in some it may perhaps be said even to the present time, insanitary conditions have continued to prevail.



82. There is no proof that sanitary improvements were the main cause of the decline of small-pox under discussion. And no adequate evidence is forthcoming to show to what extent such improvements may be considered as a subsidiary cause.

83. The decline in question followed upon the introduction of the practice of vaccination. The records of Western Europe and the United States show that, in all places whence returns were obtained, the introduction of vaccination was followed by a decline of small-pox; the decline becoming especially apparent after the lapse of such time as may be supposed to be necessary for the due spread of the practice.

Moreover, the spread of the practice and the decline of the disease do not stand as two phenomena simply following the same course, but without any tie joining the two. The experimental evidence offered at the time, namely, that the class of vaccinated persons did not take small-pox, by way either of exposure to natural contagion or of inoculation, as the unvaccinated did, connects the two and points to the spread of the practice as the cause of the decline.

84. It has been suggested that the decline was due to some general unknown conditions, which have been spoken of as "cosmic" or "secular." It has been urged that such general "cosmic" conditions led, on the one hand, to the spread of small-pox in Europe during the seventeenth and especially during the eighteenth centuries, and, on the other hand, conversely to its decline in the beginning of the nineteenth century. The possibility of such general "cosmic" conditions influencing small-pox cannot be denied; but at present, at all events, the appeal to such conditions is the result, not of positive knowledge, but of our inability to explain the phenomena otherwise. Moreover, it is not certain that the relative paucity of small-pox in Europe before the seventeenth century was not apparent rather than real, being due merely to absence of information; if so, there is no necessity to seek in "cosmic" influences the cause of the supposed later increase.

In attempting to judge of the decline in question being due to such "cosmic" influences, we are met with the difficulty that exact records of the prevalence of small-pox during the period under discussion are wanting in respect to countries where vaccination was not practised. But such information as is available goes to show that in the countries where vaccination did not become general, small-pox prevailed in the first quarter of the nineteenth century very much as it had prevailed in the eighteenth. Thus, in Egypt vaccination was not introduced until 1827, and up to that time small-pox was extremely prevalent; the decline, which in Western Europe was marked during the first quarter of the century, appears to have been absent there. Again in America, though in the early days of vaccination efforts were made to spread the practice among the native tribes, these (especially the tribes of the West) remained unvaccinated, and among them the ravages of small-pox in the first quarter of the nineteenth century are described as of extreme severity. So in Brazil, vaccination though introduced early, was not carried on with the same energy as in Europe, and here severe epidemics of small-pox occurred. There is no adequate evidence of a decline in unvaccinated countries like that which took place in vaccinated countries, and there is no sound reason for attributing the latter to any theoretical "cosmic" influences.

85. Upon the whole, then, we think that the marked decline of small-pox mortality in the first quarter of the present century affords substantial evidence in favour of the protective influence of vaccination.

86. It has been urged that the decline was too great to have been due to the amount of vaccination which prevailed. It has been shown, however, that the amount which was carried out was very considerable, and the argument that such an amount was insufficient to produce the decline in question is based on the premiss that such an amount of vaccination would at the present day be considered wholly insufficient protection. But it must be borne in mind that in the countries so often mentioned a large proportion of the population were protected by previous attacks of small-pox, either natural or inoculated; only a portion of the population needed the protection claimed for vaccination. And if the vaccination in the early years of the century was as general as we have seen reason to think it was, that, added to the protection



afforded by previous attacks of small-pox, may be regarded as adequate to have produced the decline in question.

Of course, as years went on, the proportion of the population immune through previous small-pox became, owing to the mere decline of small-pox, continually less and less, as the large number who had had the small-pox in the previous century gradually died out. After the first quarter of the century that part of the population which depended for immunity on vaccination alone became, in the absence of serious epidemics, greater and greater; and an amount of vaccination adequate to afford great protection in the earlier years ceased to be adequate for the latter years. But this brings us to the periods succeeding the first quarter of the century, which will be considered hereafter.

87. We have dealt thus with the evidence afforded by the first quarter of the present century, because it constituted a convenient epoch for inquiring whether mortality from small-pox had shown signs of diminution in the period immediately succeeding the introduction of vaccination, and not because the close of that quarter of a century was in any respect a dividing line. So far as England is concerned a new epoch commenced in 1837. There was nothing to distinguish the phenomena observable between 1825 and 1837 from those of the preceding years of the century, and the only mortality statistics in our possession relating to those intervening years became not more but less accurate and satisfactory.

*Does the history of small-pox mortality since vaccination was introduced afford warrant for a belief in its protective effect? (ii.) The period since 1825.*

88. In the year 1837, however, the present system of registration of deaths commenced in England, so that from that period more exact statistics of small-pox mortality are available. In Scotland a similar system of registration was not initiated until 1855, and in Ireland until 1864. In the latter country, however, information with reference to the mortality in preceding years was, prior to the registration of deaths, acquired when the decennial census was taken. This practice commenced at the period of the census in 1841.

89. Before proceeding to inquire what light the records of small-pox mortality in England, Scotland, and Ireland, during the years when more accurate information has existed as to small-pox mortality, throws upon the question of the effect of vaccination, it will be convenient to make a brief statement of the laws which have been from time to time passed with reference to that practice. This is important, because it has been argued that a connexion may be observed between the diminution of small-pox in the epochs subsequent to the different Acts passed by the Legislature, for the purpose of encouraging or compelling vaccination, and the increase of vaccination which would naturally result from those enactments.

90. Although the House of Commons had made grants to Jenner in 1802 and 1806, and annual grants to the National Vaccine Establishment, which was founded by Royal Warrant in the following year, no statute was passed dealing with the matter until the 23rd July 1840. On that day the Act 3 and 4 Victoria, chapter 29, entitled "An Act to extend the practice of vaccination," received the Royal Assent.

*Vaccination legislation in England and Wales.*

91. By that Act the Guardians and Overseers of every Parish or Union in England and Wales were empowered and they were thereby directed to contract with their medical officers or with any legally qualified medical practitioners for the vaccination of all persons resident in such Unions or Parishes respectively. Payments were to be made dependent on the number of persons who, not having been previously successfully vaccinated, should be successfully vaccinated by the contracting medical officer or practitioner. In making their arrangements Guardians and Overseers were by section 2 to conform to regulations made by the then existing Poor Law Commissioners, who had power conferred on them for the purpose.

By the eighth section of this statute inoculation of the small-pox was declared to be illegal and the use of it was made penal.

The provisions of this Act were by its sixth section applied to Ireland.

92. In the next year, on the 21st June 1841 (4 & 5 Victoria, chapter 32), there was supplementary legislation (1) charging the expenses of carrying out the Act of 1840 on the poor rates and (2) enacting that "the vaccination, or surgical or medical assistance incident to the vaccination of any person resident in any Union or Parish or of any of his family should not be considered parochial relief," nor should he by reason "of



“ such vaccination or assistance be deprived of any right or privilege or be subject to any disability or disqualification whatever.”

93. These Acts were repealed by the Consolidation Act of 1867, but the Act of 1840 is important historically as being the first of the series of Acts relating to vaccination; and especially so because of the terms of the eighth section forbidding inoculation; and, again, because it not only speaks of vaccination itself, but of surgical or medical assistance incident to the vaccination, which contemplates the duty of providing the surgical or medical assistance which the operation might render necessary or expedient, and the necessary expenditure in respect thereof.

94. It is to be further observed that in the legislation of 1840 and 1841 there was no compulsion on parents or others to procure or to submit to vaccination. The services of the vaccinator were to be provided, and he was to vaccinate all who might choose to come to him for that purpose. It is not clear whether re-vaccination was contemplated. Although there is a difference in the language of sections 2 and 6 relating to England and Wales and Ireland respectively, yet it is probable that, looking to the mode of payment provided in section 1, a second vaccination was not contemplated by the Act.

95. At the suggestion of the Epidemiological Society, which had been formed in 1850, Lord Lyttelton introduced into the House of Lords the measure which afterwards passed into law on the 20th August 1853 without opposition or division. This was really the first measure for compulsory vaccination. It is entitled “An Act to extend and make compulsory the Practice of Vaccination.” It applied only to England and Wales.

The principal provisions of this Act were as follows:—The Guardians and Overseers, when the Parishes were not in union, were required, subject to the approval of the Poor Law Board, to divide their Unions and Parishes into convenient districts (section 1) for the purpose of giving increased facilities for the vaccination of the poor. They were to appoint a convenient place for the attendance of the vaccinator, and to give notice of place and time when he would attend to vaccinate, and to inspect the progress of the vaccination. The vaccinations were limited to those persons only who had not already been successfully vaccinated. It seems, therefore, that re-vaccination was not contemplated by this Act.

The second section contains the compulsion. It was enacted that within *three* months of the birth the father or mother or, in the event of their death or inability, the person in charge of the child, within *four* months, should take the child to the appointed vaccinator, unless such parent or person should have obtained a certificate of previous vaccination from some other practitioner; and the vaccinator was required thereupon, or as soon after as it might be conveniently and properly done to vaccinate the child. It was enacted by the third section, “Upon the eighth day following vaccination the father, &c., shall take or cause to be taken the child to the vaccinator for his inspection that “that he may ascertain the result of the operation.” By the fourth section it was provided that the vaccinator was to give a certificate of successful vaccination to the father, &c., and to transmit a duplicate to the Registrar of Births and Deaths of the Sub-District in which the vaccination was performed. Section 5 made provision for children who in the opinion of any medical officer or practitioner were not in a fit and proper state to be successfully vaccinated. In such a case the medical officer or practitioner was to deliver a certificate to that effect, which was to remain good for two months and to be renewable from two months to two months until the child should be considered fit for vaccination, when it was to be taken to be vaccinated. So long as the certificate or its renewal should last, it was a sufficient defence against any complaint against the father, &c., for noncompliance with the Act.

The sixth section contained provisions for the payment to the Public Vaccinator of not less than 1s. 6d. when the vaccination was at the residence of the vaccinator or not more than two miles therefrom, and not less than 2s. 6d. if over two miles therefrom; and the seventh related to certificates of insusceptibility to the vaccine disease.

Then followed provisions as to the duties of the Registrar. The Registrar of the Sub-District was to keep a register of persons whose successful vaccination certificates had been transmitted to him by the vaccinator. By section 9 the Registrar was required on or within seven days from the registration of the birth of a child to send to the father, &c. notice in a given form, to take care that the child should be vaccinated, and of the time and place of the attendance of the vaccinator; and it was enacted that if



after such notice the father, &c. of the child should not cause the child to be vaccinated or should not on the eighth day after vaccination take, or cause to be taken, the child for inspection, then the father, &c. should forfeit a sum not exceeding 20s. These penalties were recoverable before two Justices according to 12 Vict. c. 43., and paid into the funds for the relief of the poor.

96. The statute just referred to, though repealed, is notable by reason of a legal decision upon it which probably gave rise to an amendment of the law by a subsequent statute, out of which difficulties arose which will be shortly referred to. In the case of *Pilcher v. Stafford*, reported 4 Best and Smith, 775 : 33 L.J. (M.C.) 13, the Defendant had on the 18th February 1863 been convicted and fined 2s. 6d. on an information and summons brought before Magistrates by the Registrar for a breach of this Act, in not having after notice and within three months of the birth taken his child to the appointed vaccinator for vaccination. Subsequently, the child not having been vaccinated the Registrar brought a fresh information and complaint for the same cause. The Justices dismissed the information because they held that the offence of not taking the child to be vaccinated within the three months was a single definite offence, and that the Defendant having been once convicted and fined for this offence, it was contrary to law to convict and fine the Defendant a second time for the same offence.

The Court of Queen's Bench (Cockburn, Chief Justice, and Blackburn and Mellor, Justices) on this ground decided against the Registrar, and confirmed the decision of the Magistrates.

97. By an Act passed on the 1st August 1861 permission was given to Guardians and Overseers to appoint persons to institute and conduct proceedings for the purpose of enforcing obedience to the Vaccination Acts, and further enacting that proceedings might be taken at any time during which the parent remained in default, and that the expenses of prosecuting might be charged upon the poor rate. This statute is noteworthy, as by some persons a difference in results, favourable to vaccination, has been insisted upon, between the *permission* to appoint such persons and the *obligation*, afterwards imposed, to appoint them.

98. Attention must here be called to a statute of great importance in the administrative history of the Vaccination Laws. In the year 1858 an Act was passed with the short title of "The Public Health Act, 1858," and entitled in full "An Act for vesting in the Privy Council certain Powers for the Protection of the "Public Health." A Board, called the General Board of Health, had about 10 years before been constituted, and had had certain powers entrusted to it. The Board was appointed only to continue till the 1st of September 1858, and the Act now under consideration vested in the Privy Council, not only certain other duties and powers with reference to Public Health, but also certain special powers and duties with reference to the Vaccination Laws. It was enacted by the second section that the Privy Council might from time to time issue regulations as to the due qualification of persons to be thereafter contracted with by Guardians and Overseers under the Vaccination Acts, and for securing the efficient performance of vaccination by the persons with whom such contracts were made; and it was further enacted that money voted by Parliament for or towards defraying the expenses of the National Vaccine Establishment or otherwise providing for the supply of vaccine lymph should be applied under the direction of the Privy Council. Section 3 gave the Privy Council power to inquire generally as to matters concerning the Public Health, and particularly as to the observance of the regulations under the Act. For the purpose of aiding the Privy Council in the execution of their duties they were to have the power of appointing a medical officer and other persons. One of the principal duties (sections 5 and 6) of the medical officer was to report to the Privy Council generally upon health matters, and especially once a year on all proceedings taken under the Act. This report was to be presented annually to Parliament.

The Act also contained a provision that "penalties under the Vaccination Act might "be proceeded for by any Registrar, Public Vaccinator, or Officer authorised by the "Guardians and Overseers, and that the costs of such proceedings should be defrayed "out of the Common Fund of the Union or out of the Poor Rates of any Parish not "included in any Union."

99. This Act (which with the exception of its eighth section was made perpetual by the Statute 22 and 23 Vict. cap. 3), and the powers of the Privy Council conferred by it,



were practically administered under the Vice-President of the Committee of the Privy Council on Education.

The Poor Law Board still continued to exercise control over the form of the contracts between Guardians and Overseers with Public Vaccinators, but the Privy Council, with the aid of their medical officers, were charged with the duty of supervising the efficient performance of vaccination.

How this Act was administered by the Privy Council, their medical officer and their staff, is recorded in the annual reports presented and laid before Parliament by their medical officer in accordance with the Act.

The Privy Council continued to exercise jurisdiction under the Act of 1858, and the Act of 1867 herein-after referred to until the Local Government Board Act, 1871, came into force. This vested in the new Board the powers which under the statutes of 1858 and 1867, the Privy Council had exercised.

100. The Act of 1867 (30 & 31 Vict. cap. 184) besides being a consolidating statute introduced some important additional provisions. The sections which it is important to notice contained the following provisions:—Sections 1 and 3 dealt with the division of the county into Vaccination Districts. This was to be done by the Guardians under the control of the existing Poor Law Board, to which body, in 1871, by virtue of the statute before referred to, the Local Government Board succeeded. The contracts and their form were also to be subject to the approval of the Poor Law Board. The Privy Council were authorised to pay to the Public Vaccinators additional sums to those which the Guardians and Overseers had to pay under their contracts. The intention of this clause appears to have been to enable the Privy Council to reward the Public Vaccinators for good and successful work and to stimulate their diligence and care in the performance of their duties. The following clause increased the remuneration to be allowed to Public Vaccinators to not less than 2s. where the vaccination was performed at more than a mile, but less than two miles, from the residence of the vaccinator, and to not less than 3s. where the vaccination was performed at a distance exceeding two miles.

By the eighth section provision for the encouragement of re-vaccination was specifically made by Parliament. The Privy Council was authorised to issue regulations in respect of the re-vaccination of persons who might apply to be re-vaccinated; and in that case the Guardians were required to pay fees for successful re-vaccinations performed in accordance with such regulations of an amount equal to two-thirds of the primary vaccination fees. It would appear from the language of this section that the wording of some existing contracts had included re-vaccination. By the eighth section, however, it was enacted that these contracts should not apply to re-vaccination upon the Act coming into operation.

The 16th section enacted as to every child born in England that within *three* months after the birth of such child or where by reason of the death, &c., of the parent, any other person should have the custody of such child within three months after receiving such custody, the parent or such person should take it or cause it to be taken to the Public Vaccinator . . . or should within such period cause it to be vaccinated by some medical practitioner. If the child were brought to a Public Vaccinator in compliance with the conditions in the Act he was required to vaccinate the child.

By section 17 it was enacted that upon the same day in the week following, in cases in which the operation was performed by the Public Vaccinator, the parent or person must again take the child to the vaccinator or his deputy, so that he might inspect the child and ascertain the result of the operation, and, if he should think fit, take from such child lymph for the performance of other vaccinations; in the event of the vaccination having been unsuccessful, the parent or other person was required, if the vaccinator so directed, to cause the child to be forthwith again vaccinated.

By section 27 a new and important provision was made with reference to the enforcement of the Act. This provision was repealed by the Act of 1871, and another scheme of legislation adopted to which future reference will be made. By this section it was enacted—"The Registrar of each District shall within one week after the first day of January and the first day of July in each year make a list of all cases in which certificates of vaccination have not been received by him during the preceding half year, and shall submit the same to the next meeting of the Guardians for whom he acts, and the said Guardians shall forthwith make enquiries into the circumstances of the cases, and if they find that the provisions of the Act have been neglected, shall cause proceedings to be taken against the persons in default."

This section imposed a duty on the Guardians to prosecute, and section 28 provided for their expenses and authorised them to pay any officer appointed by them to



prosecute persons charged with offences against the Act or otherwise to enforce its provisions. Provision for the appointment of such officers had been made by the Act of 1861, 24 & 25 Vict. c. 59., and their appointment was afterwards by the Act of 1871 made compulsory.

By section 29 it was provided as follows :—“ Every parent or person having the custody of a child who shall neglect to take the child or cause it to be taken to be vaccinated or after vaccination to be inspected, and shall not render a reasonable excuse for his neglect, shall be guilty of an offence, and be liable to be proceeded against summarily, and upon conviction to pay a penalty not exceeding 20s.” This clause was in substance a re-enactment of the clause in the Act of 1853 (section 9) upon which the case of *Pilcher v. Stafford* was decided, but it is important to refer to it again in connexion with the changes of the law contained in other sections of the Act.

A point of some importance has been raised with reference to the construction of section 29. It will be observed that it provides that every parent or person having the custody of a child who neglects to have the child vaccinated “ and shall not render a reasonable excuse for his neglect ” shall be guilty of an offence and be liable to be proceeded against, and upon conviction to pay a penalty. It has been contended that this points to the reasonable excuse being rendered before proceedings are taken. There is much to be said for this contention. The parent “ guilty of an offence ” and “ liable to be proceeded against ” is one who neglects and shall not render a reasonable excuse for his neglect. The section does not say that the parent who, without reasonable excuse, neglects to have his child vaccinated shall be guilty of an offence, as one would expect if the intention were that the excuse should be rendered to the magistrate as a defence when proceedings have been instituted. The section is certainly so framed as to afford countenance to the contention we are considering. On the other hand, no body or person is indicated to whom an excuse can be rendered before the proceedings are instituted. There is no machinery provided for hearing and adjudicating upon excuses at that period and for giving a certificate that a reasonable excuse has been rendered to serve as a bar to further proceedings. On the whole, then, although it is not for us to express an opinion on the legal construction of the clause, which is very unhappily framed, it would probably be construed as intending that the excuse should be rendered to the tribunal before which proceedings for the neglect to vaccinate are pending.

We now come to the much-discussed section 31. It seems probable that section 31 was enacted for the very purpose of supplementing the provisions of section 29. Its purpose seemed to be to enable those who prosecuted (and this duty had by section 27 been imposed upon the Guardians) to follow the parent responsible for the vaccination so long as the child remained unvaccinated, and by penalties to compel the parent to do what according to the law was his duty. Nevertheless, no conviction could take place under this section without a previous order of a magistrate, and the first step in the transaction was to inform the magistrate and obtain a summons to the parent to appear with the child before him. Thereupon, when the parent appeared absolute discretion was left to the magistrate before whom the case was brought. He might or might not make the necessary order. If he did not, no further penalty could be inflicted. If he did and it was obeyed no penalty could follow. But if he did and it was disobeyed, one penalty alone could be inflicted for the disobedience. A further order must be made, and that order disobeyed before another penalty—not for disobedience to the first—but to the second order, could be inflicted. This is evident from the words of the section. The magistrate “ may, if he “ thinks fit ”—words of absolute discretion—make an order for vaccination ; and there is nothing in the section to bind the magistrate’s discretion to refrain from making an order should he for any reason come to the conclusion that it was expedient to do so. The words of the section seem purposely framed to leave the discretion to the magistrate. It is true that if the order was once made and disobeyed, without the justification of one or other of the two matters of excuse mentioned in the section, the disobedience must be punished and the parent prosecuted (the words are “ shall ” be proceeded against), but the discretion was to be exercised before the order was made, and this discretion is left to the magistrate.

101. Accordingly it was held in the case of *Allen and Worthy*, reported L.R. 5, Q.B. 163, that, notwithstanding the principle laid down in *Pilcher v. Stafford* a second conviction could follow disobedience to a second order under the section just referred to. Lord Chief Justice Cockburn said, “ I think that the intention of the Legislature “ was not simply that a penalty should be imposed on a person once for all if he



“ omitted to do that which, in the view of the Legislature, public health and safety required, but that a penalty might be imposed so long as disobedience to its enactments continued. I therefore hold that the powers given by section 31 are not confined to one order and one conviction, but that the proceedings may be repeated *toties quoties* so long as disobedience continues.”

Another point arose in *Allen v. Worthy* which it is needless to refer to, for it can scarcely be supposed that as a matter of discretion a magistrate would make an order, if a *bonâ fide* certificate of unfitness, made less than two months before the order, was still in force.

102. There is no doubt that those magistrates who, in the exercise of their discretion, made repeated orders in respect of the same child, were in the opinion of many mistaken, and harsh results often followed, and the evidence of this, which was brought before them, doubtless led to the recommendation in the Report (dated 23rd May 1871) of the Select Committee of the House of Commons on the Vaccination Act (1867), that no more than two penalties or one full penalty should be imposed in respect of the same child.

103. It was also contended that persons convicted of disobedience to orders and committed to prison under this Act ought to have been treated as debtors and not as criminal prisoners. An action was brought against the officials of Portsmouth Gaol, in which a person who had been fined, and had been imprisoned on non-payment, was dealt with according to the ordinary prison rules and not as a debtor. Lord Justice, then Mr. Justice, Lindley tried the case at Winchester Assizes in January 1884, and afterwards, by a considered judgment in which he drew a distinction between a conviction imposing a fine and an order made for payment of money, held that in this case there was a breach of a statutory duty punishable by a fine, which was in the eye of the law a criminal offence. In the result he found the defendants had acted rightly in dealing with the plaintiff according to the prison rules applicable to criminal prisoners, and that the plaintiff had no legal right to be treated as a debtor. He gave judgment for the defendant with double costs. (*Kennard v. Simmons, Cutt and Woods*, Winchester Assizes, January 1889.)

104. The Act of 1867 remained unaffected by subsequent legislation until the 1st January 1872, when the Vaccination Act, 1871, came into force.

Meanwhile a Select Committee had been appointed to enquire into the working of the Act of 1867, and this Act of 1871 was introduced into the House of Commons by Mr. Forster, its chairman. The Act was entitled “an Act to amend the Vaccination Act, 1867,” and was to be construed as one with it.

A change of importance was made by the fifth section which rendered the appointment and payment of officers to prosecute and to enforce the provisions of the Acts obligatory upon the Guardians, whereas it had theretofore been permissive only. These officers were to be called Vaccination Officers. They were to perform all the duties imposed on the Registrars by the principal Act, except giving the notices to the parents within seven days of the registration of the births under section 15 of the Act of 1867.

By section 8 it was provided that every Registrar of Births and Deaths for any place should once at least transmit to each Vaccination Officer a return of all births and deaths of infants under 12 months of age, which, since the date of the last return had been registered by him. Section 9 deals with re-vaccination. It enacts that when the operation of re-vaccination is performed gratuitously by a Public Vaccinator on the application of any person, he shall deliver to such person a notice requiring him to attend for inspection, and if that notice is not complied with such person is rendered liable to pay to the Guardians a fee of 2s. 6d.

Section 10 imposes a fine of 20s. on any person who prevents a Public Vaccinator taking lymph from any child as provided by section 17 of the principal Act. Section 11 imposes a similar penalty on any parent who fails to produce a child when required by summons under section 31 of the principal Act. By the same section any complaint may be made and any information laid at any time not exceeding 12 months from the time when the matter of complaint or information arose, and not subsequently. This is a new provision as to limitation. There is a further provision as to re-vaccination in section 13 granting fees to the medical officer of the Union if, while attending as such medical officer upon a small-pox patient, he either (1) vaccinates a person who has never been vaccinated or had small-pox, or (2) re-vaccinates any person who is resident



in the same house with the person sick of the small-pox, and has never been re-vaccinated, being of the age at which public re-vaccination is paid for to a Public Vaccinator under the regulations for the time being of the Privy Council.

105. By the joint effect of the Vaccination Act, 1874, the fifth section of the Vaccination Act, 1871, and the Local Government Act, 1871, the Local Government Board was clothed with the same powers with respect to the Guardians and Vaccination Officers in matters relating to vaccination as the Poor Law Board\* possessed with regard to Guardians and Officers of Guardians in matters relating to the relief of the Poor, and had power to make rules and regulations, and it was enacted that all enactments relating to such powers and to such orders, rules, and regulations by the Poor Law Board\* should apply, *mutatis mutandis*, to the Local Government Board, including rules, orders, and regulations prescribing the duties of Guardians and their Officers in relation to the institution and conduct of the proceedings to be taken for enforcing the provisions of the Vaccination Acts of 1867 and 1871, and the payment of the costs and expenses relating thereto; and rules, orders, and regulations under the Act of 1874 were to be deemed to be made under section 5 of the Act of 1871.

106. By the machinery thus introduced, provision was made in substitution for that contained in the 27th section of the Act of 1867, which was repealed by the Act of 1871; that section, as has been pointed out, imposed upon the Guardians the duty of prosecuting cases brought to their knowledge by the Registrar. The new machinery gives power to the Local Government Board to regulate this matter among others, and they have acted on this power.

107. The Bill as introduced by Mr. Forster, the Chairman of the Select Committee, contained a clause (1) so framed as to carry out the recommendation in the Report as to repeated prosecutions in the case of the same child. This was struck out in the House of Lords, the amendment being carried by eight votes against seven. When the Bill was returned to the Commons Mr. Forster at that period of the session felt compelled to accept the amendment, being anxious to pass the Bill.

108. One other point remains for notice arising under the Act of 1871. It is provided by section 11 that the defendant in any proceedings under the Acts of 1867 and 1871 may appear by any member of his family, or by any other person authorised by him in that behalf.

109. Such are the provisions of the Acts which have from time to time been passed with direct reference to the subject of vaccination. The legislation is founded on the assumption of its efficacy, and that its advantages are so manifest that it is the duty of the State to enforce it even by the imposition of penalties for its neglect.

110. It is obvious that the most important part of the work rests with the public authorities to whom the vaccination of the population has been entrusted, subject to the general control of the central authority.

111. The superintendence, direction, and inspection of the work of vaccination was vested in the Privy Council in accordance with the terms of the Act of 1858 and the Act of 1867. Since 1871 the duties have been transferred to the Local Government Board.

112. How this part of the work of the Local Government Board is now carried on, and how it has been carried on since 1871, will be found in the evidence of Dr. Thorne Thorne. Q. 3334-4010.

\* The Poor Law Commissioners were constituted by the 4 & 5 Wm. 4. c. 76. By the 10 & 11 Vict. c. 107. another Commission with similar powers was appointed, the name of which was changed by 12 & 13 Vict. c. 103. sec. 21 to the Poor Law Board. By sec. XV. of 4 & 5 W. 4. c. 76. the Commissioners had powers conferred on them to make and issue orders, rules, and regulations for the guidance "and control of all" Guardians, Vestries, and Parish Officers so "far as relates to the management or relief of the poor and the keeping, etc., of accounts, and making and entering into contracts in all matters relating to such management or relief." By sec. 41 the Commissioners were empowered "to make orders to direct Guardians to appoint paid officers for superintending or assisting in the administration and relief and employment of the poor, and to direct the execution of the duties of such officers."



Q. 4011-  
266.  
Q. 4267-  
307.

Mr. Farn and Dr. Cory also in their evidence describe how vaccination is practised under the supervision of the Local Government Board and its officers.

113. With regard to proceedings by way of prosecution, the following order as to repeated prosecution has been made under section 5 of the Act of 1871 and the Act of 1874, viz., the Order of the 31st October 1874, sections 16 and 17, which are explained by the letter of the Local Government Board to the Evesham Guardians of the 17th September 1875. The 16th section of the Order is clear in its terms, that the Guardians shall in all cases in which the provisions of the Vaccination Acts for enforcing vaccination have been neglected, cause proceedings to be taken against the persons in default, and for this purpose shall give directions to the Vaccination Officer to institute and conduct such proceedings, but no such directions shall authorise the Vaccination Officer to take further proceedings under section 31 of the Vaccination Act, 1867, in any case in which an order has been already obtained and summary proceedings taken under that section until he shall have brought the circumstances of the case under the notice of the Guardians and received their special directions therein. Article 17 is to the effect that the Vaccination Officer shall take such proceedings as may be necessary under the Vaccination Acts in any case in which the Local Government Board desire him to do so.

114. With regard to the Statute Law relating to vaccination in Ireland and Scotland it is not necessary to state it at length for it is founded on the English Law. It will suffice to indicate generally the scheme of the Acts and point out any special provisions or differences.

*Vaccination  
legislation  
in Ireland.*

115. First as to Ireland. The earliest legislation for Ireland in respect to vaccination is contained in the two Acts of 1840 and 1841, which applied equally to England and Wales and Ireland; they have been already set out sufficiently. It will be remembered that by the Act of 1840 the practice of small-pox inoculation is forbidden and made punishable by imprisonment.

116. The first statute specially dealing with Ireland only in the matter of vaccination was the 14th & 15th Vict. cap. 168. section 13. By that statute the medical officer of every district in Ireland constituted under that Act was required to vaccinate every one coming to him for that purpose, subject to regulations of the Poor Law Commissioners for Ireland; and in 1858, by 21 & 22 Vict. c. 64., the Committee of Management for each Dispensary District in Ireland was required to divide their District into Vaccination Districts, subject to the approval of the Poor Law Commissioners. The Committee were to require the medical officer at each District to attend at some convenient place within the District to be approved by the Committee at such times as they should approve; and the medical officer was required to vaccinate all persons resident in his District who might come to him for that purpose, or whom he might be requested to vaccinate, being fit subjects for vaccination, subject to any such regulations as might be fixed by the Poor Law Commissioners; the medical officer was to report as to the number of persons successfully vaccinated by him in each year, and the payments were to be charged to the divisions comprising such dispensary, as all other medical relief was charged.

117. In 1863, by the 26 & 27 Vict. c. 52., vaccination was made compulsory, and by section 1 parents and guardians of children born in Ireland after 1st January 1864 were required within six calendar months to take them to the medical officer of the District to be vaccinated, who was required to vaccinate them.

By section 2 parents and guardians were required to take the child again on the eighth day following the vaccination to the medical officer for inspection.

Similar provisions are made with reference to certificates as to children unfit for vaccination, and as to the insusceptible as in the English statute of 1853.

One shilling was under this Act the appointed fee for the medical officer for a successful vaccination.

By section 8 a similar provision to that of the English Act was made (except that the period of birth was fixed at six months instead of three), for notice being given by the Registrar to the parents of the duty to vaccinate, and imposing a fine of 10s. on



the parent or guardian who might be in default in not carrying the child to be vaccinated, or in not taking it for inspection.

By section 13 the Guardians of any Union in Ireland were authorised to direct proceedings against defaulters, and it was enacted that such proceedings might be taken at any time during default.

118. By a short Act passed in 1868 (31 & 32 Vict. c. 87.) it was enacted that the vaccination or surgical or medical assistance incident thereto should not be considered as parochial relief, and, in the words of the English Act, the practice of inoculation with variolous matter was made penal.

119. In 1878 a section similar in effect and almost in words to section 31 of the English Act of 1867 was introduced into the Public Health Act for Ireland passed in the year 1878. It is striking evidence of the importance then attached to the provisions of that section by the Legislature that they introduced it into the Irish Code of Sanitary Law.

120. In 1879 an Act (42 & 43 Vict. c. 70.) to amend the Acts relating to vaccination in Ireland was passed whereby the age within which children were to be brought for vaccination was altered to three months, thus assimilating the law to that in force in England; and the provisions as to bringing the child for inspection on the eighth day following vaccination were re-enacted, and it was added as an additional reason for this, that, if the Vaccinator thought fit, he might take lymph from the child for the performance of other vaccinations; these amendments being taken from the English statutes.

By section 6 the vaccination fee was raised to 2s. and not only in the case of successful vaccination but also of re-vaccination; provided that the Vaccinator had made his report to the Committee of Management as required by the 21 & 22 Vict. c. 64.

By section 7 penalties of 20s. were imposed (1) on persons preventing any dispensary medical officer from taking lymph from a child as provided by section 4; (2) failing to produce a child when required by any summons under the Acts; (3) upon every parent or person having custody of a child who should neglect to produce it for vaccination or inspection as provided.

It was also provided by this section that a defendant in proceedings under the Vaccination Acts might appear by any member of his family or any person authorised by him.

These provisions were similar to those of the English Acts.

By section 10 it was enacted that the Guardians of any Union in Ireland might direct proceedings for the purpose of enforcing obedience to the Vaccination (Ireland) Acts; and the medical officers of the Dispensary District who might be required to attend and did attend were to receive pay not exceeding a guinea a day.

There are also contained in these Acts provisions as to certificates, returns, and registration, *mutatis mutandis*, similar to those in the English Acts.

121. The Vaccination (Ireland) Acts now in force are 21 & 22 Vict. c. 64., 26 & 27 Vict. c. 52., 31 & 32 Vict. c. 87., and 42 & 43 Vict. c. 70.; except sections 1, 2, 3, and 13 of 26 & 27 Vict. c. 52., which are repealed by section 13 of 42 & 43 Vict. c. 70. The other Acts mentioned above are inserted as part of the history of vaccination legislation for Ireland.

122. The mode in which the Vaccination Law in Ireland is administered will be found in the evidence of Sir F. MacCabe and of Dr. Grimshaw.

Q. 3033-151; 2687-3032.

123. The Law of Vaccination in Scotland is really comprised in one statute passed in 1863—26 & 27 Victoria chapter 108—and entitled “An Act to extend and make compulsory the Practice of Vaccination in Scotland.”

*Vaccination legislation in Scotland.*

After reciting that it was expedient to extend and in certain cases to make compulsory the practice of vaccination in Scotland, and to make further provision for the vaccination of the Poor, the Act by its first section enacted that within two months after the passing of the Act the Parochial Board of any Parish or combination of Parishes in Scotland should appoint a registered practitioner to be the vaccinator within such Parish or Combination.



By section 3 the remuneration to the vaccinators is made to depend on the number of persons not previously vaccinated who have been successfully vaccinated by each vaccinator, varying, as in the English Act, according to distance, between 1s. 6d. and 2s. 6d.

By section 4 notice must be given by the Parochial Board of the appointment and name of each vaccinator to the Board of Supervision, the Registrar-General, and the Registrar for the District.

By section 5 the Parochial Board, and every vaccination and other officer, were to exercise their functions in conformity with the regulations from time to time issued by the Board of Supervision, and which it was authorised and required to make.

By section 6 provision was made for payment, from the rates and grant for medical treatment of the poor, of the expenses incurred in the execution of the Act, and by section 7 it was provided that the vaccination or any surgical or medical treatment incidental to it should not be considered parochial relief, and should not affect the parochial settlement.

By section 8 the duty was imposed on parents or persons having custody of any child, within six months of the birth, to cause it to be vaccinated by a medical practitioner, and a certificate of the vaccination was to be given to the parents and by them transmitted to the Registrar and registered by him.

Then followed similar provisions to those in the English Acts (section 9) for the case of children not in a fit state to be vaccinated, and of those who are (section 10) insusceptible. Similar provisions were also (section 11) made imposing on the Registrar the duty of delivering to any person registering the birth of a child a notice of the duty to vaccinate, with copies of the certificates in the schedule.

Section 12 made provision for the special dealing with Insular, Highland, and other Districts on the application of the Parochial Boards to the Board of Supervision, who might appoint a medical practitioner to travel through the districts to vaccinate.

Then followed certain provisions for the registration of vaccinators, and by the 17th section penalties not exceeding 20s. were imposed upon parents if they did not within 10 days of notice from the Registrar send in a certificate of the vaccination or its postponement, and failing payment the defaulters might be committed for a term not exceeding 10 days.

The 18th section imposed the duty on the Registrar once in every six months to transmit to the Inspector of the Poor of the Parish or Combination in which the District was situate a list of such persons as had failed to transmit or lodge a certificate of vaccination in terms of the Act. This list was to be laid before the Parochial Board, which was required to issue an order to vaccinate the persons named in the list. Notice of the order was then directed to be given to the parents or persons having the custody of the children, and in pursuance of the order the Vaccinator was required to vaccinate the persons named therein at a time not less than 10 days or more than 20 days after the date of the notice; and if any person or parent should refuse to allow the operation to be performed, such person or parent was to be liable to a penalty not exceeding 20s., and failing payment to be imprisoned for a period not exceeding 10 days. It was subsequently held by the Court of Session in Scotland that the section permitted repeated prosecutions so long as the child or person remained on the list.

Provisions were then made by sections 19 to 23 as to certificates and registration, which need not be particularized.

Section 24 prohibited under a penalty inoculation with variolous matter or by wilful exposure to any variolous matter, or anything infected with small-pox, or wilfully by any other means producing the disease of small-pox in Scotland.

Section 25 dealt with the recovery of penalties. It provided that the warrant for imprisonment should specify the amount of penalty and expenses, and also specify a period (not exceeding in any case two months) at the expiration of which the party should be discharged notwithstanding such penalty or expenses should not have been paid. By section 26 proceedings might be taken at any time during default, and that section provided that the penalty should be awarded to the support of the poor.

An important section, the 27th, enacted that wherever the Parochial Board should fail to do or perform any of the acts or duties by the Act required of them, it should be lawful for the Board of Supervision without prejudice to the right to compel performance thereof, to do and perform the same, and the acts of the Board of Supervision should be as valid and effectual as if done or performed by the Parochial Board.



124. This Act is the only one now in force in Scotland with direct reference to vaccination, except that by a section (57) of the Public Health (Scotland) Act, 1867, the local authority under that Act may defray the cost of vaccinating such persons as to them may seem expedient not being children of paupers or persons ordered to be vaccinated in terms of the 18th section of the Act 26 & 27 Vict. c. 108.

125. By section 5 of the Secretary for Scotland Act, 1885 (48 & 49 Vict. c. 61.), all powers vested in or imposed on one of Her Majesty's Principal Secretaries of State, or by the enactments mentioned in Part One of the Schedule to the Act, are transferred to the Secretary of State for Scotland created by the Act. Among the Acts mentioned in the Schedule is the Vaccination (Scotland) Act, 1863 (26 & 27 Vict. c. 108.).

Under the provisions of the Local Government (Scotland) Act of 1894, the Local Government Board for Scotland has been substituted for the Board of Supervision and Parish Councils for the Parochial Boards; but, except in this substitution, no alteration has been made in the legislation as to vaccination.

126. Details of the mode in which the vaccination law of Scotland is administered will be found in the evidence of Mr. John Skelton, then Chairman of the Board of Supervision. Both the statute law and the method of administration differ very materially from those which prevail in this country. Some of the points of difference in the two systems have so material a bearing upon questions submitted to us for report that it will be well here to call attention to them. An official vaccinator is appointed by each Parochial Board. Beyond the vaccination of paupers and the children of paupers, however, his duty is confined to vaccinating defaulters. The great majority of vaccinations in Scotland are performed by private medical practitioners at the expense of the parent or guardian. In all cases in which certificates are not received by the Registrar of compliance with the requirements of the Act, the names are inserted in a list of defaulters sent every six months to the Parochial Board. It then becomes the duty of that Board to see that these defaulters are vaccinated. They go through the list transmitted to them and notify to the parent or guardian of each child that its name is contained in the list, and that if not privately vaccinated it will be vaccinated by the official vaccinator.\* The Parochial Board issue an order to the vaccinator to vaccinate the persons named in the list not less than 10 days nor more than 20 after the date of the notice to the parent or guardian. A large number of the defaulters are privately vaccinated in consequence of these notices before the visit of the official vaccinator. If this has not been done the vaccinator calls on each of the defaulters and offers to vaccinate. If the parent's consent is obtained the child is vaccinated; if consent is refused, a certificate is given stating the fact and the ground of refusal. Any other reason for not vaccinating a child, such as insusceptibility, previous vaccination, or condition of health, is also embodied in a certificate. The power conferred upon local authorities under the Public Health Act by section 57 of that Act to afford gratuitous vaccination appears to be exercised chiefly when epidemics are present within the district of the local authority. A house-to-house visitation is often made by medical men appointed for the purpose, and a large number of re-vaccinations are thus effected. The distinguishing feature of the Scotch system which deserves special attention is that the operation is carried out in almost all cases at the house where the vaccinated person is residing. The official vaccinator visits the case there after an interval of eight days to see whether the operation has been successful. Although he pays no visit in the interval he would often be sent for if any untoward symptoms presented themselves, inasmuch as the official vaccinator is in ninety-nine cases out of a hundred the officer whose duty it is to afford medical assistance to the poor.

Q. 278,84-28,110.

127. We have now to consider the records of small-pox mortality in the United Kingdom since the time when the number of deaths and their causes came to be accurately registered, to inquire into the prevalence and progress of the practice of vaccination during the same period, and to see how this evidence bears upon the question whether vaccination exercises a protective influence against small-pox.

*Influence of spread of vaccination on small-pox mortality.*

\* As stated in § 125, the Parish Council has now taken the place of the Parochial Board.



*In England and Wales.\** 128. The following table shows the mortality from small-pox in England and Wales during each of the years 1838-1842 and 1847-1894. The figures for the years 1843-1846 are not available.

1, App. 114 5.  
6, App. 779.

| Year. | Population. | Number of Deaths from Small-pox (with those returned as from Chicken-pox). | Deaths from Small-pox (with those returned as from Chicken-pox) to every 100,000 living. | Year. | Population. | Number of Deaths from Small-pox (with those returned as from Chicken-pox). | Deaths from Small-pox (with those returned as from Chicken-pox) to every 100,000 living. |
|-------|-------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------|-------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 1838  | 15,287,699  | 16,268                                                                     | 106                                                                                      | 1867  | 21,677,525  | 2,513                                                                      | 12                                                                                       |
| 1839  | 15,514,253  | 9,131                                                                      | 59                                                                                       | 1868  | 21,948,713  | 2,052                                                                      | 9                                                                                        |
| 1840  | 15,730,813  | 10,434                                                                     | 66                                                                                       | 1869  | 22,223,299  | 1,565                                                                      | 7                                                                                        |
|       |             |                                                                            |                                                                                          | 1870  | 22,501,316  | 2,620                                                                      | 12                                                                                       |
| 1841  | 15,929,492  | 6,368                                                                      | 40                                                                                       |       |             |                                                                            |                                                                                          |
| 1842  | 16,130,326  | 2,715                                                                      | 17                                                                                       | 1871  | 22,788,594  | 23,126                                                                     | 102                                                                                      |
| 1843  | 16,332,228  | Causes of death not abstracted by Registrar-General.                       |                                                                                          | 1872  | 23,096,495  | 19,094                                                                     | 82                                                                                       |
| 1844  | 16,535,174  |                                                                            |                                                                                          | 1873  | 23,508,556  | 2,364                                                                      | 10                                                                                       |
| 1845  | 16,739,136  |                                                                            |                                                                                          | 1874  | 23,724,834  | 2,162                                                                      | 9                                                                                        |
| 1846  | 16,944,092  |                                                                            |                                                                                          | 1875  | 24,045,385  | 952                                                                        | 4                                                                                        |
| 1847  | 17,150,018  | 4,227                                                                      | 25                                                                                       | 1876  | 24,370,267  | 2,518                                                                      | 10                                                                                       |
| 1848  | 17,356,882  | 6,903                                                                      | 40                                                                                       | 1877  | 24,699,539  | 4,395                                                                      | 18                                                                                       |
| 1849  | 17,564,656  | 4,644                                                                      | 26                                                                                       | 1878  | 25,033,259  | 1,970                                                                      | 8                                                                                        |
| 1850  | 17,773,324  | 4,665                                                                      | 26                                                                                       | 1879  | 25,371,489  | 631                                                                        | 3                                                                                        |
|       |             |                                                                            |                                                                                          | 1880  | 25,714,288  | 754                                                                        | 3                                                                                        |
| 1851  | 17,982,849  | 6,997                                                                      | 39                                                                                       |       |             |                                                                            |                                                                                          |
| 1852  | 18,193,206  | 7,320                                                                      | 40                                                                                       | 1881  | 26,046,142  | 3,231                                                                      | 12                                                                                       |
| 1853  | 18,404,368  | 3,151                                                                      | 17                                                                                       | 1882  | 26,334,942  | 1,439                                                                      | 5                                                                                        |
| 1854  | 18,616,310  | 2,508                                                                      | 15                                                                                       | 1883  | 26,626,949  | 1,056                                                                      | 4                                                                                        |
| 1855  | 18,829,090  | 2,525                                                                      | 13                                                                                       | 1884  | 26,922,192  | 2,363                                                                      | 9                                                                                        |
| 1856  | 19,042,412  | 2,277                                                                      | 12                                                                                       | 1885  | 27,220,706  | 2,936                                                                      | 11                                                                                       |
| 1857  | 19,256,516  | 3,936                                                                      | 20                                                                                       | 1886  | 27,522,532  | 368                                                                        | 1                                                                                        |
| 1858  | 19,471,291  | 6,460                                                                      | 33                                                                                       | 1887  | 27,827,706  | 593                                                                        | 2                                                                                        |
| 1859  | 19,686,701  | 3,848                                                                      | 20                                                                                       | 1888  | 28,136,258  | 1,142                                                                      | 4                                                                                        |
| 1860  | 19,902,713  | 2,749                                                                      | 14                                                                                       | 1889  | 28,448,239  | 106                                                                        | 4                                                                                        |
|       |             |                                                                            |                                                                                          | 1890  | 28,763,673  | 111                                                                        | 4                                                                                        |
| 1861  | 20,119,314  | 1,320                                                                      | 7                                                                                        |       |             |                                                                            |                                                                                          |
| 1862  | 20,371,013  | 1,628                                                                      | 8                                                                                        | 1891  | 29,082,585  | 140                                                                        | 5                                                                                        |
| 1863  | 20,625,855  | 5,964                                                                      | 29                                                                                       | 1892  | 29,405,054  | 554                                                                        | 2                                                                                        |
| 1864  | 20,883,889  | 7,684                                                                      | 37                                                                                       | 1893  | 29,731,100  | 1,584                                                                      | 5                                                                                        |
| 1865  | 21,145,151  | 6,411                                                                      | 30                                                                                       | 1894  | 30,060,763  | 928                                                                        | 3                                                                                        |
| 1866  | 21,409,684  | 3,029                                                                      | 14                                                                                       |       |             |                                                                            |                                                                                          |

129. In order to make the figures in the above table comparable throughout, we are obliged to include with the deaths returned as from small-pox those returned as from

\* The table given in § 128 is for England and Wales, including the metropolis. When considering the earlier statistics of small-pox mortality, we had in the absence of figures relating to the whole country to confine ourselves, in the main, to the material to be obtained from the old London Bills of Mortality. Accordingly, though it must be remembered that the area of London for registration purposes is a much larger one than that covered by the old Bills of Mortality, the following table, which shows the mortality from small-pox in registration London during each of the years 1838-1894, may be of interest. (The figures relating to the last eleven years of the table include the deaths, of London residents, in the Metropolitan Asylums Board's hospitals situated outside London.)

| Year. | Population. | Number of deaths from Small-pox. | Deaths from Small-pox to every 100,000 living. | Year. | Population. | Number of Deaths from Small-pox. | Deaths from Small-pox to every 100,000 living. |
|-------|-------------|----------------------------------|------------------------------------------------|-------|-------------|----------------------------------|------------------------------------------------|
| 1838  | 1,766,169   | 3,917                            | 216                                            | 1867  | 3,085,971   | 1,845                            | 44                                             |
| 1839  | 1,802,751   | 634                              | 35                                             | 1868  | 3,131,160   | 597                              | 19                                             |
| 1840  | 1,840,091   | 1,233                            | 67                                             | 1869  | 3,176,308   | 275                              | 9                                              |
|       |             |                                  |                                                | 1870  | 3,221,394   | 973                              | 30                                             |
| 1841  | 1,878,205   | 1,053                            | 56                                             |       |             |                                  |                                                |
| 1842  | 1,917,103   | 360                              | 19                                             | 1871  | 3,267,251   | 7,912                            | 242                                            |
| 1843  | 1,954,041   | 478                              | 22                                             | 1872  | 3,319,736   | 1,736                            | 54                                             |
| 1844  | 1,993,816   | 1,804                            | 89                                             | 1873  | 3,373,065   | 113                              | 3                                              |
| 1845  | 2,073,298   | 909                              | 44                                             | 1874  | 3,427,250   | 67                               | 2                                              |
| 1846  | 2,113,535   | 237                              | 12                                             | 1875  | 3,482,306   | 40                               | 1                                              |
| 1847  | 2,202,673   | 955                              | 43                                             | 1876  | 3,538,246   | 736                              | 21                                             |
| 1848  | 2,244,837   | 1,620                            | 72                                             | 1877  | 3,595,085   | 2,551                            | 71                                             |
| 1849  | 2,287,302   | 321                              | 23                                             | 1878  | 3,652,837   | 1,477                            | 39                                             |
| 1850  | 2,330,054   | 499                              | 21                                             | 1879  | 3,711,347   | 450                              | 12                                             |
|       |             |                                  |                                                | 1880  | 3,771,139   | 471                              | 12                                             |
| 1851  | 2,373,081   | 1,062                            | 45                                             |       |             |                                  |                                                |
| 1852  | 2,416,367   | 1,159                            | 48                                             | 1881  | 3,824,980   | 2,367                            | 62                                             |
| 1853  | 2,459,899   | 211                              | 9                                              | 1882  | 3,882,956   | 430                              | 11                                             |
| 1854  | 2,503,662   | 694                              | 28                                             | 1883  | 3,901,309   | 136                              | 3                                              |
| 1855  | 2,547,639   | 1,030                            | 41                                             | 1884  | 3,940,042   | 1,236                            | 31                                             |
| 1856  | 2,591,815   | 331                              | 20                                             | 1885  | 3,979,160   | 1,449                            | 36                                             |
| 1857  | 2,636,174   | 136                              | 6                                              | 1886  | 4,018,066   | 24                               | 6                                              |
| 1858  | 2,680,700   | 242                              | 9                                              | 1887  | 4,058,565   | 9                                | 2                                              |
| 1859  | 2,725,374   | 1,153                            | 42                                             | 1888  | 4,098,860   | 0                                | 2                                              |
| 1860  | 2,770,181   | 893                              | 32                                             | 1889  | 4,139,555   | 0                                | 0                                              |
|       |             |                                  |                                                | 1890  | 4,180,654   | 4                                | 1                                              |
| 1861  | 2,815,101   | 217                              | 8                                              |       |             |                                  |                                                |
| 1862  | 2,860,117   | 366                              | 13                                             | 1891  | 4,222,157   | 8                                | 2                                              |
| 1863  | 2,905,210   | 1,996                            | 69                                             | 1892  | 4,264,070   | 47                               | 1                                              |
| 1864  | 2,950,361   | 347                              | 18                                             | 1893  | 4,306,411   | 206                              | 5                                              |
| 1865  | 2,995,551   | 610                              | 21                                             | 1894  | 4,349,166   | 89                               | 2                                              |
| 1866  | 3,040,761   | 1,391                            | 46                                             |       |             |                                  |                                                |



chicken-pox, the Registrar-General not having distinguished between such returns in his abstracts for the years 1838-1842 and 1847-1854. In this connexion, however, the inclusion or exclusion of deaths returned as from chicken-pox makes no material difference; the number of deaths at all ages so returned being but small, in comparison with the deaths at all ages returned as from small-pox, except as regards the years 1889, 1890, and 1891, when the small-pox mortality was very small.

Had the number of deaths returned as from chicken-pox been large enough to affect to any material extent the figures in the table, we should have excluded these deaths so far as we were able, though we think it possible and even probable that some of them may have been mistaken cases of small-pox. It is highly improbable that the number of such cases was considerable, seeing that, since deaths from chicken-pox have been separately recorded, the number of them has been small and approximately the same, year by year, whether small-pox was prevalent or not.

130. There exist no figures, comparable throughout the period 1838-1894, by which we can measure the extent to which, at one time as compared with another, the practice of vaccination prevailed in England and Wales in those years. That there has been, speaking generally, during that period a large spread of the practice is beyond doubt. We have given an account of the legislation from time to time enacted to this end, and we shall therefore merely recapitulate here the dates of the principal Acts of Parliament relating to the practice of vaccination in England and Wales which have come into force during this period.

In 1840-1 the means of vaccination were provided at the expense of the Poor Rates for every person in England and Wales.

In 1853 the practice of vaccination was made compulsory in regard to children born in England or Wales after the 1st August 1853; and penalties were imposed for non-compliance. The provisions for this purpose then enacted were found in working to be very imperfect; and, indeed, the obligation to be vaccinated remained little more than nominal down to the date of the appointment of paid Vaccination Officers. At the same time, however, the fact that the law required vaccination within a prescribed period from birth no doubt increased the spread of the practice.

In 1867 the laws relating to vaccination in England and Wales were consolidated and amended; and the provisions then enacted, as regards those Unions where the power given to appoint paid Vaccination Officers was exercised, were such as to make effective the obligation to be vaccinated. In many Unions, however, this power was not at once exercised. From the evidence taken by the Select Committee of the House of Commons in 1871 it appears that of 260 Unions inspected by the Medical Department of the Privy Council in the course of the year 1870, two years and more after the Act of 1867 had come into force, 121 were reported as not having at the date of inspection appointed Vaccination Officers, and 127 as having made such appointments, there being no report on the point as to the remaining 12 Unions (Appendix No. 15 to the Committee's Report); and in May 1871 Dr. Seaton informed the Committee that there were still a great many Unions in which Vaccination Officers had not been appointed (Question 5499).

In 1871 the Act of 1867 was amended by making the appointment of paid Vaccination Officers compulsory in all Unions, by simplifying and improving the arrangements for the registration of vaccination, and in other ways. The effect of the amending Act towards increasing the spread of vaccination would be thus more marked in Unions where the power to appoint paid Vaccination Officers had not before its enactment been exercised; but the amendment of the law as to the registration of vaccination was such as to render it, in every Union, less likely that the obligation to be vaccinated would be evaded.

131. The records kept under the Vaccination Act of 1871, and tabulated by the Local Government Board, show the amount of primary vaccination, performed within a



certain period of birth, of children whose births were registered in England or Wales during the years 1872-1893. The following table gives the figures :—

6, App. 775.

| Year. | Births registered during Year. | Of the Children whose Births were registered during the Year given in the First Column, by the 31st January in the Year next but one following that Year there were : |                                            |                |                    |                                               |            |                                                                                               |      |
|-------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------|--------------------|-----------------------------------------------|------------|-----------------------------------------------------------------------------------------------|------|
|       |                                | Successfully vaccinated.                                                                                                                                              | Certified as insusceptible of Vaccination. | Had Small-pox. | Died unvaccinated. | Vaccination postponed by Medical Certificate. | Remaining. | The Children not finally accounted for (including cases postponed) being Per Cent. of Births. |      |
| 1872  | - - - -                        | 821,856                                                                                                                                                               | 698,137                                    | 1,693          | 905                | 78,594                                        | 42,527     |                                                                                               | 5.1  |
| 1873  | - - - -                        | 826,508                                                                                                                                                               | 704,666                                    | 942            | 86                 | 80,512                                        | 4,264      | 36,038                                                                                        | 4.8  |
| 1874  | - - - -                        | 854,787                                                                                                                                                               | 727,065                                    | 920            | 96                 | 85,325                                        | 5,677      | 35,704                                                                                        | 4.8  |
| 1875  | - - - -                        | 850,354                                                                                                                                                               | 722,466                                    | 838            | 38                 | 86,673                                        | 5,914      | 34,425                                                                                        | 4.7  |
| 1876  | - - - -                        | 887,694                                                                                                                                                               | 763,277                                    | 848            | 107                | 84,930                                        | 5,528      | 33,004                                                                                        | 4.3  |
| 1877  | - - - -                        | 887,947                                                                                                                                                               | 766,824                                    | 926            | 118                | 79,497                                        | 6,681      | 33,901                                                                                        | 4.5  |
| 1878  | - - - -                        | 891,743                                                                                                                                                               | 760,982                                    | 840            | 44                 | 87,936                                        | 6,475      | 35,466                                                                                        | 4.7  |
| 1879  | - - - -                        | 880,222                                                                                                                                                               | 756,835                                    | 742            | 26                 | 78,478                                        | 6,670      | 37,471                                                                                        | 5.0  |
| 1880  | - - - -                        | 881,652                                                                                                                                                               | 750,203                                    | 859            | 46                 | 87,361                                        | 5,930      | 37,253                                                                                        | 4.9  |
| 1881  | - - - -                        | 883,744                                                                                                                                                               | 765,162                                    | 1,017          | 81                 | 77,471                                        | 6,302      | 33,711                                                                                        | 4.5  |
| 1882  | - - - -                        | 889,082                                                                                                                                                               | 763,525                                    | 993            | 45                 | 81,498                                        | 7,598      | 35,423                                                                                        | 4.8  |
| 1883  | - - - -                        | 890,780                                                                                                                                                               | 762,080                                    | 1,012          | 93                 | 81,955                                        | 8,110      | 37,440                                                                                        | 5.1  |
| 1884  | - - - -                        | 906,581                                                                                                                                                               | 764,975                                    | 1,363          | 81                 | 90,134                                        | 8,693      | 41,335                                                                                        | 5.5  |
| 1885  | - - - -                        | 894,263                                                                                                                                                               | 757,714                                    | 1,278          | 42                 | 83,686                                        | 9,323      | 42,220                                                                                        | 5.8  |
| 1886  | - - - -                        | 903,846                                                                                                                                                               | 754,059                                    | 1,278          | 20                 | 90,774                                        | 10,187     | 47,528                                                                                        | 6.4  |
| 1887  | - - - -                        | 886,198                                                                                                                                                               | 733,980                                    | 1,556          | 27                 | 87,827                                        | 10,402     | 52,406                                                                                        | 7.1  |
| 1888  | - - - -                        | 879,813                                                                                                                                                               | 719,103                                    | 1,888          | 12                 | 83,287                                        | 12,282     | 62,701                                                                                        | 8.5  |
| 1889  | - - - -                        | 885,909                                                                                                                                                               | 707,161                                    | 1,758          | 2                  | 88,995                                        | 13,366     | 74,627                                                                                        | 9.9  |
| 1890  | - - - -                        | 875,188                                                                                                                                                               | 682,560                                    | 1,672          | 2                  | 91,768                                        | 13,615     | 85,571                                                                                        | 11.3 |
| 1891  | - - - -                        | 914,079                                                                                                                                                               | 693,117                                    | 1,806          | 9                  | 96,351                                        | 13,823     | 108,973                                                                                       | 13.4 |
| 1892  | - - - -                        | 890,695                                                                                                                                                               | 663,657                                    | 1,983          | 26                 | 92,490                                        | 13,278     | 119,261                                                                                       | 14.9 |
| 1893  | - - - -                        | 914,557                                                                                                                                                               | 661,513                                    | 3,394          | 39                 | 102,442                                       | 13,845     | 133,324                                                                                       | 16.1 |

From these figures it may be inferred that, as regards those children whose births were registered during each of the years 1872-1883, the proportion primarily vaccinated remained practically the same. The effect of the opposition to the practice of vaccination, which in some parts of the country has grown of recent years (though to some extent at all events it has existed in England during the whole period now dealt with), is shown by the gradual diminution of the proportion primarily vaccinated in the case of children whose births were registered in England or Wales during each of the ten years 1884-1893. The diminution of this proportion did not, of course, necessarily result at once in a diminished proportion of the population who had, at some time in their lives, been vaccinated.

132. The materials before us do not allow us to make any numerical statement of the proportion, as time went on, during the period 1838-1894, of the population of England and Wales who had at some time been vaccinated. So far as we can judge of the effect of the efforts made during that period to extend the practice of vaccination, the proportion of the population who had at some time been vaccinated has steadily grown, though with no even rate of increase, during the years from 1840 onwards, down to a recent date at all events. The rate of increase was greater in 1853 and the few years immediately following it than in previous years and again expanded, still more considerably, in the years from 1868 to 1872 and perhaps in some few succeeding years.

133. Speaking generally of the period since 1838, there has been, as the table given in § 128 clearly shows, a marked though irregular decline in the death-rate from small-pox.

It may be well, too, to note at once a striking feature of this decline. During the period 1838-1894 the decline in the death-rate at all ages from small-pox has not been shared alike by the population at every age. While the decline in the death-rate of the population under ten years of age has been even more marked than the decline shown



by the table in § 128 in the death-rate at all ages, there has been amongst the population over ten years of age a far less marked decline or, at certain of the higher ages, an actual increase in the death-rate. We shall have presently (§§ 168–201) to discuss fully this question of the altered age incidence of fatal small-pox both in England and Wales and in Scotland and Ireland.

134. The following table shows the mortality\* from small-pox in Scotland during *In Scotland.* each of the years 1855–1894:—

| Year. | Population. | Number of deaths from Small-pox (with those returned as from Chicken-pox). | Deaths from Small-pox (with those returned as from Chicken-pox) to every 100,000 living.* | Year. | Population. | Number of deaths returned from Small-pox only. | Deaths returned from Small-pox only to every 100,000 living.* |
|-------|-------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------|-------------|------------------------------------------------|---------------------------------------------------------------|
| 1855  | 2,978,065   | 1,309                                                                      | 48                                                                                        | 1877  | 3,590,022   | 38                                             | 1                                                             |
| 1856  | 2,995,771   | 1,306                                                                      | 46                                                                                        | 1878  | 3,628,268   | 4                                              | ·1                                                            |
| 1857  | 3,012,310   | 845                                                                        | 30                                                                                        | 1879  | 3,665,443   | 8                                              | ·2                                                            |
| 1858  | 3,027,665   | 332                                                                        | 11                                                                                        | 1880  | 3,705,994   | 10                                             | ·3                                                            |
| 1859  | 3,041,812   | 682                                                                        | 24                                                                                        | 1881  | 3,742,564   | 19                                             | ·5                                                            |
| 1860  | 3,054,738   | 1,495                                                                      | 51                                                                                        | 1882  | 3,770,657   | 3                                              | ·1                                                            |
| 1861  | 3,069,404   | 766                                                                        | 26                                                                                        | 1883  | 3,798,961   | 11                                             | ·3                                                            |
| 1862  | 3,097,009   | 426                                                                        | 14                                                                                        | 1884  | 3,827,478   | 14                                             | ·4                                                            |
| 1863  | 3,126,879   | 1,646                                                                      | 55                                                                                        | 1885  | 3,856,307   | 39                                             | 1                                                             |
| 1864  | 3,156,021   | 1,741                                                                      | 58                                                                                        | 1886  | 3,885,155   | 24                                             | ·6                                                            |
| 1865  | 3,185,437   | 383                                                                        | 12                                                                                        | 1887  | 3,914,318   | 17                                             | ·4                                                            |
| 1866  | 3,215,129   | 200                                                                        | 6                                                                                         | 1888  | 3,943,701   | 3                                              | ·1                                                            |
| 1867  | 3,245,098   | 100                                                                        | 3                                                                                         | 1889  | 3,973,305   | 8                                              | ·2                                                            |
| 1868  | 3,275,350   | 15                                                                         | ·5                                                                                        | 1890  | 4,003,132   | 0                                              | 0                                                             |
| 1869  | 3,305,885   | 64                                                                         | 2                                                                                         | 1891  | 4,033,180   | 0                                              | 0                                                             |
| 1870  | 3,336,707   | 114                                                                        | 3                                                                                         | 1892  | 4,063,452   | 11                                             | ·3                                                            |
| 1871  | 3,368,921   | 1,442                                                                      | 44                                                                                        | 1893  | 4,093,959   | 68                                             | 2                                                             |
| 1872  | 3,404,798   | 2,448                                                                      | 74                                                                                        | 1894  | 4,124,691   | 129                                            | 3                                                             |
| 1873  | 3,441,056   | 1,126                                                                      | 33                                                                                        |       |             |                                                |                                                               |
| 1874  | 3,477,704   | 1,246                                                                      | 37                                                                                        |       |             |                                                |                                                               |
| 1875  | 3,514,744   | 76                                                                         | 2                                                                                         |       |             |                                                |                                                               |
| 1876  | 3,552,183   | 39                                                                         | 1                                                                                         |       |             |                                                |                                                               |

6, App. 632.

135. It will be seen that the figures in the above table are not strictly comparable throughout, in that the deaths returned as from chicken-pox are included with those returned as from small-pox in each of the years 1855–1876, while excluded as regards the later years 1877–1894. The inclusion of deaths returned as from chicken-pox during the years 1855–1876 makes, however, no material difference; the number of deaths at all ages so returned being but small, in comparison with the deaths at all ages returned as from small-pox, except as regards the years 1868 and 1876, when the mortality from that disease was very small.

136. During the years 1855–63 the practice of vaccination was not obligatory in Scotland. Since 1848, however, under rules issued in that year by the Board of Supervision for the Relief of the Poor, the means of gratuitous vaccination had been provided in such parishes as from time to time participated in the Parliamentary grant in aid of medical relief.

In 1863, as has been stated, the practice of vaccination was made compulsory in regard to children born in Scotland after the 1st January 1864. The provisions of this Act, and certain of the provisions of two later statutes having some bearing on the practice of vaccination in Scotland, are stated in §§ 123–125.

137. The records kept under the Vaccination Act, and tabulated by the Registrar-General of Births and Deaths in Scotland, show the amount of primary vaccination, performed within a certain period of birth, of children whose births were registered in Scotland during the years 1864–1893. The following table gives the figures; for convenience of comparison we state them as nearly as we can in the same form as the

\* Note.—The death-rates given in the table in § 134 are not solely based on the numbers, also given in that table, of the population and of the deaths; but allowance is made for cases in which the cause of death was not specified.



somewhat similar figures, given in §131, relating to the primary vaccination of children in England and Wales.

App. 634,  
27,883;  
914.

| Year. | Births registered during Year. | Of the Children whose Births were registered during the Year given in the First Column, by the 31st December in the Year following that Year there were: |                                            |                |                    |                                               |            |                                                                                               |     |
|-------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------|--------------------|-----------------------------------------------|------------|-----------------------------------------------------------------------------------------------|-----|
|       |                                | Successfully vaccinated (including those found insusceptible of Vaccination from having been previously vaccinated).                                     | Certified as insusceptible of Vaccination. | Had Small-pox. | Died unvaccinated. | Vaccination postponed by Medical Certificate. | Remaining. | The Children not finally accounted for (including cases postponed) being Per Cent. of Births. |     |
| 1864  | - - - -                        | 108,851                                                                                                                                                  | 95,487                                     | 667            | 154                | 9,180                                         | 662        | 2,701                                                                                         | 3.1 |
| 1865  | - - - -                        | 113,129                                                                                                                                                  | 99,855                                     | 474            | 34                 | 9,366                                         | 719        | 2,681                                                                                         | 3.0 |
| 1866  | - - - -                        | 113,730                                                                                                                                                  | 100,635                                    | 332            | 30                 | 9,433                                         | 579        | 2,721                                                                                         | 2.9 |
| 1867  | - - - -                        | 114,181                                                                                                                                                  | 101,290                                    | 233            | 16                 | 9,355                                         | 670        | 2,617                                                                                         | 2.9 |
| 1868  | - - - -                        | 115,514                                                                                                                                                  | 102,370                                    | 277            | 7                  | 9,440                                         | 914        | 2,506                                                                                         | 3.0 |
| 1869  | - - - -                        | 113,441                                                                                                                                                  | 99,439                                     | 177            | 17                 | 10,069                                        | 966        | 2,773                                                                                         | 3.3 |
| 1870  | - - - -                        | 115,446                                                                                                                                                  | 102,104                                    | 215            | 28                 | 9,724                                         | 843        | 2,532                                                                                         | 2.9 |
| 1871  | - - - -                        | 116,184                                                                                                                                                  | 102,098                                    | 241            | 142                | 10,280                                        | 841        | 2,582                                                                                         | 2.9 |
| 1872  | - - - -                        | 118,959                                                                                                                                                  | 105,224                                    | 184            | 64                 | 10,325                                        | 811        | 2,351                                                                                         | 2.7 |
| 1873  | - - - -                        | 119,810                                                                                                                                                  | 105,340                                    | 162            | 39                 | 10,527                                        | 1,113      | 2,629                                                                                         | 3.1 |
| 1874  | - - - -                        | 123,861                                                                                                                                                  | 108,227                                    | 206            | 33                 | 11,288                                        | 1,229      | 2,878                                                                                         | 3.3 |
| 1875  | - - - -                        | 123,651                                                                                                                                                  | 108,348                                    | 190            | 1                  | 11,326                                        | 1,211      | 2,575                                                                                         | 3.1 |
| 1876  | - - - -                        | 126,706                                                                                                                                                  | 112,163                                    | 177            | 5                  | 10,760                                        | 1,034      | 2,567                                                                                         | 2.8 |
| 1877  | - - - -                        | 126,900                                                                                                                                                  | 112,709                                    | 180            | 4                  | 10,374                                        | 1,304      | 2,329                                                                                         | 2.9 |
| 1878  | - - - -                        | 126,854                                                                                                                                                  | 112,100                                    | 190            | 3                  | 10,905                                        | 1,196      | 2,460                                                                                         | 2.9 |
| 1879  | - - - -                        | 125,782                                                                                                                                                  | 111,818                                    | 180            | 3                  | 9,999                                         | 1,290      | 2,492                                                                                         | 3.0 |
| 1880  | - - - -                        | 124,674                                                                                                                                                  | 109,740                                    | 155            | 0                  | 11,016                                        | 1,404      | 2,359                                                                                         | 3.0 |
| 1881  | - - - -                        | 126,277                                                                                                                                                  | 111,360                                    | 150            | 0                  | 10,587                                        | 1,586      | 2,594                                                                                         | 3.3 |
| 1882  | - - - -                        | 126,162                                                                                                                                                  | 110,543                                    | 192            | 4                  | 11,073                                        | 1,713      | 2,637                                                                                         | 3.4 |
| 1883  | - - - -                        | 124,516                                                                                                                                                  | 109,271                                    | 194            | 2                  | 10,713                                        | 1,884      | 2,452                                                                                         | 3.5 |
| 1884  | - - - -                        | 129,123                                                                                                                                                  | 112,387                                    | 242            | 0                  | 11,694                                        | 1,964      | 2,836                                                                                         | 3.7 |
| 1885  | - - - -                        | 126,152                                                                                                                                                  | 110,094                                    | 225            | 0                  | 10,872                                        | 2,073      | 2,888                                                                                         | 3.9 |
| 1886  | - - - -                        | 127,968                                                                                                                                                  | 111,105                                    | 201            | 0                  | 11,282                                        | 2,325      | 3,055                                                                                         | 4.2 |
| 1887  | - - - -                        | 124,467                                                                                                                                                  | 107,450                                    | 236            | 0                  | 11,269                                        | 2,465      | 3,047                                                                                         | 4.4 |
| 1888  | - - - -                        | 123,294                                                                                                                                                  | 107,131                                    | 216            | 0                  | 10,434                                        | 2,417      | 3,096                                                                                         | 4.5 |
| 1889  | - - - -                        | 122,849                                                                                                                                                  | 105,217                                    | 235            | 0                  | 11,479                                        | 2,692      | 3,226                                                                                         | 4.8 |
| 1890  | - - - -                        | 121,612                                                                                                                                                  | 103,883                                    | 222            | 2                  | 11,779                                        | 2,710      | 3,016                                                                                         | 4.7 |
| 1891  | - - - -                        | 126,076                                                                                                                                                  | 107,762                                    | 268            | 1                  | 12,293                                        | 2,637      | 3,115                                                                                         | 4.6 |
| 1892  | - - - -                        | 125,119                                                                                                                                                  | 107,568                                    | 345            | 0                  | 11,693                                        | 2,468      | 3,045                                                                                         | 4.4 |
| 1893  | - - - -                        | 127,155                                                                                                                                                  | 108,390                                    | 509            | 1                  | 12,781                                        | 2,474      | 3,000                                                                                         | 4.5 |

From these figures it may be inferred that, as regards those children whose births were registered during each of the years 1864-1893, the proportion primarily vaccinated remained practically the same.

138. We are unable to make any numerical statement of the proportion, at one time as compared with another, during the period 1855-1894, of the population of Scotland who had at some time in their lives been vaccinated. We are able to state, however, that the proportion of the population who had at some time been vaccinated was not, during the years from 1855 to 1863, a high one. This is clearly indicated by the vaccination returns, from parishes participating in the Parliamentary grant, given by the Board of Supervision in their eighteenth annual report (at pages 219-20), by that Board's comment on those returns (at page x), and by the evidence given by Dr. Wood before the Select Committee of the House of Commons in 1871 (Questions 4355, 4371, 4474). During the years from 1864 onwards, down to the present time, that proportion has without doubt steadily grown, probably with a very even rate of increase. At no time during that period has there been any considerable opposition in Scotland to the practice of vaccination.



139. During the period 1855-1864 the death-rate from small-pox in Scotland, though varying from year to year, gave no indication of decline. Speaking generally of the period since 1864, there has been, as the table given in § 134 clearly shows, a marked though irregular decline in the death-rate from small-pox.

With this decline there has been in Scotland, as in England and Wales, a striking change in the age incidence of fatal small-pox.

140. Exact statistics of the mortality from small-pox in Ireland are only available from the year 1864 onwards. On the taking, however, of the census in 1841, in 1851 and in 1861 (and again in 1871), inquiries were made as to the number and causes of death amongst the population, since the date of the previous census. From the information so obtained it has been calculated that the average annual death-rate from small-pox in Ireland per 100,000 living was 73 during the inter-censal period 1831-41, 49 during the inter-censal period 1841-51, and 21 during the inter-censal period 1851-61. It has not been suggested that these calculations, from materials depending on the recollection of the people who answered the census questions and based on the assumption that every death from small-pox was returned and returned but once, give any but approximate figures; there is reason to believe that the mortality from small-pox was probably even higher during the periods in question than the figures so obtained would indicate.

The following table shows the mortality from small-pox in Ireland during each of the years 1864-1894:—

| Year. | Population. | Number of deaths returned from Small-pox only. | Deaths returned from Small-pox only to every 100,000 living. | Year. | Population. | Number of deaths returned from Small-pox only. | Deaths returned from Small-pox only to every 100,000 living. |
|-------|-------------|------------------------------------------------|--------------------------------------------------------------|-------|-------------|------------------------------------------------|--------------------------------------------------------------|
| 1864  | 5,640,527   | 842                                            | 15                                                           | 1880  | 5,202,648   | 381                                            | 7                                                            |
| 1865  | 5,594,589   | 457                                            | 8                                                            | 1881  | 5,145,770   | 72                                             | 1                                                            |
| 1866  | 5,522,942   | 491                                            | 3                                                            | 1882  | 5,101,018   | 129                                            | 3                                                            |
| 1867  | 5,486,509   | 16                                             | ·3                                                           | 1883  | 5,023,811   | 16                                             | ·3                                                           |
| 1868  | 5,465,914   | 21                                             | ·4                                                           | 1884  | 4,974,561   | 1                                              | ·02                                                          |
| 1869  | 5,449,094   | 14                                             | ·3                                                           | 1885  | 4,938,588   | 4                                              | ·1                                                           |
| 1870  | 5,418,512   | 30                                             | ·6                                                           | 1886  | 4,905,895   | 2                                              | ·04                                                          |
| 1871  | 5,398,179   | 660                                            | 12                                                           | 1887  | 4,857,119   | 14                                             | ·3                                                           |
| 1872  | 5,372,890   | 3,243                                          | 60                                                           | 1888  | 4,801,312   | 3                                              | ·1                                                           |
| 1873  | 5,327,938   | 496                                            | 9                                                            | 1889  | 4,757,385   | 0                                              | 0                                                            |
| 1874  | 5,298,979   | 566                                            | 11                                                           | 1890  | 4,717,959   | 0                                              | 0                                                            |
| 1875  | 5,278,629   | 531                                            | 10                                                           | 1891  | 4,681,248   | 7                                              | ·1                                                           |
| 1876  | 5,277,544   | 19                                             | ·4                                                           | 1892  | 4,638,169   | 0                                              | 0                                                            |
| 1877  | 5,286,380   | 65                                             | 1                                                            | 1893  | 4,615,312   | 1                                              | ·02                                                          |
| 1878  | 5,282,246   | 864                                            | 16                                                           | 1894  | 4,600,599   | 72                                             | 2                                                            |
| 1879  | 5,265,625   | 662                                            | 13                                                           |       |             |                                                |                                                              |

141. There are no available figures, comparable throughout the period 1831-1894, by which we can measure the extent to which, at one and another time, the practice of vaccination was accepted in Ireland in those years. There is no doubt that there has been, speaking generally, during that period a large spread of the practice. In §§ 115-121 we have given an account of the legislation from time to time enacted to this end, and we shall therefore merely recapitulate here the dates of the principal Acts of Parliament relating to the practice of vaccination in Ireland which have come into force during this period.

In 1840-1 provision was made for vaccination in Ireland, as in England and Wales, at the expense of the Poor Rates. The arrangements made in consequence, appear, however, to have been by no means so complete in Ireland as they were in England and Wales; and, in October 1846, in 57 out of the 130 Unions into which Ireland was then divided, no arrangements had been made.

In 1851 it was provided that the medical officer of every dispensary district then constituted in Ireland should vaccinate all persons who might come to him for that purpose.



In 1858 it was provided that the committee of management of every dispensary district in Ireland should divide the district into so many vaccination districts as they might deem advisable and necessary, and should require the medical officer of the district to attend at some convenient place within each vaccination district for the purpose of vaccinating all persons resident in his district who might come to him.

In 1863 the practice of vaccination was made compulsory, within six months after birth, in regard to children born in Ireland after the 1st January 1864, and penalties were imposed for non-compliance.

In 1878 provisions, similar to those contained in section 31 of the English Vaccination Act of 1867, were enacted; the maximum penalty for non-compliance with the Justice's order directing vaccination, being, as in the English Act, twenty shillings, whereas the maximum penalty under the Irish Vaccination Act of 1863 for non-compliance with the requirement of vaccination was ten shillings.

In 1879 the Acts relating to vaccination in Ireland were amended; the practice of vaccination being made compulsory, within three months after birth, or within three months after being brought into Ireland, in regard to children born in, or brought into, Ireland after the passing of the Act. The maximum penalty under the Vaccination (Ireland) Acts for non-compliance with the requirement of vaccination was fixed at twenty shillings; the arrangements for the registration of vaccination were improved; and the Acts were amended in other ways. This amendment of the law was such as to render it less likely that the obligation to be vaccinated would be evaded.

3045-7;  
38-9.

2900-3;  
50; 6299-  
1.

142. We are unable to make any numerical statement of the proportion, at one time as compared with another during the period 1831-1894, of the population of Ireland who had at some time in their lives been vaccinated. At no time during that period has there been any considerable opposition in Ireland to the practice of vaccination: and so far as we can judge of the effect of the efforts made during that period to extend the practice, the proportion of the population who had at some time been vaccinated has steadily grown, though with no even rate of increase, during the years from 1840 onwards down to the present time. The rate of increase, though varying considerably in different years, has no doubt on the whole been far greater since 1863 than in previous years.

143. The approximate figures given in § 140 in regard to the death-rate from small-pox in Ireland during the inter-censal periods 1831-1841, 1841-1851, and 1851-1861, so far as they go, tend to show that the death-rate from small-pox was on the whole considerably less in the second period than in the first, and again considerably less in the third period than in the second; and that the death-rate from small-pox even in the third period was on the whole considerably greater than it has been in any ten years since 1863. Speaking generally then of the period since 1831, we find that there has been a marked though irregular decline in the death-rate from small-pox.

With this decline there has been in Ireland, as in England and Wales and Scotland, a striking change in the age incidence of fatal small-pox.

England  
and Wales,  
Scotland  
and Ireland.

144. We have dealt so far with the evidence afforded by the statistics of the mortality from small-pox at different epochs in view of the spread or continued practice of vaccination. It seems to us scarcely possible to deny that speaking generally of the British Isles a more vaccinated population has exhibited a diminished mortality from small-pox. It was not, of course, to be expected that this should be seen year by year, or that the correspondence should be exact, even assuming vaccination to be the principal cause of this diminished mortality. We have already pointed out that small-pox tends at times to become epidemic, *i.e.*, to spread more readily than at other times. The occurrence of the conditions, whatever they may be, which cause the disease to be thus epidemic have of course no relation to the state of the population as regards vaccination, even conceding to the full that it has a protective effect. The only result of widespread vaccination, in a case where small-pox became epidemic, could be to



render the extent of the epidemic more limited, and its fatality less than it would otherwise be. All that we should anticipate then would be a general correspondence over a long series of years between a vaccinated condition of the people and a diminished mortality from small-pox.

145. In considering whether vaccination has been the principal cause of the decline, we must inquire whether the other causes suggested by those who deny the efficacy of vaccination will satisfactorily account for it.

146. It is said that the decline has, in the main, been due to changes in the general conditions of life in the different parts of the United Kingdom, apart from the spread of the practice of vaccination; amongst other things, to improvement of sanitary conditions.

147. It is beyond doubt that an infectious disease like small-pox is, other things being equal, more likely to spread in towns than in country districts, and more likely to spread in crowded town districts than in others not so densely populated; so that we should expect a lessened proportion of over-crowded dwellings, by diminishing the opportunities for contagion, to check the prevalence of the disease and consequently to render its mortality less.

148. Now it may be that during the period of the decline under consideration (that is in England and Wales during the period from 1838 onward, in Scotland from 1865 onward and in Ireland from 1841), a diminishing proportion of the population has, in the towns, been living in densely built areas and in over-crowded dwellings. So far as this has been the case, it has tended to the diminution of the prevalence of, and mortality from, small-pox.

149. On the other hand it is certain that, during the period of the decline, there has been in England and Wales and in Scotland, though not in Ireland, a large increase of the population; so that the density of the population in two out of these parts of the United Kingdom, taking each of them as a whole, has been increasing.

And it is equally certain, and probably far more important, that in all of them, during the period of the decline, there has been a continually growing proportion of the population living in the towns, and particularly in the larger towns. [Census reports: of England and Wales, in 1881, vol. iv., pp. 8-10; in 1891, vol. iv., pp. 9-12; of Scotland, in 1871, vol. i., pp. xvi and xxiii-xxv; in 1881, vol. i., pp. xiv and xviii; in 1891, vol. i., pp. xiii and xviii; of Ireland, in 1841, pp. vii-viii; in 1851, part vi., pp. xiii-xv; in 1861, part v., pp. ix-x; in 1871, part iii., pp. 12-13; in 1881, part ii., p. 6; in 1891, part ii., pp. 8-9.] This growth of the proportion of the population living in towns has been a condition tending to an increased prevalence of, and mortality from, small-pox.

150. There has also been, during the period of the decline, another change in the conditions of life, affecting all three countries, which would seem, at all events on *a priori* grounds, to have largely tended to an increased prevalence of small-pox; namely, the enormous and continued extension of movement among the population and of communication with other countries, following the increasing facilities for such movement and communication.

151. We have already pointed out that on *a priori* grounds it is reasonable to think that improved sanitary conditions would tend to diminish the fatality of, and so to a corresponding extent the mortality from, small-pox. And there can be no doubt that the period with which we are dealing has been characterised by an improvement of



this description. There has been better drainage, a supply of purer water, and in other respects more wholesome conditions have prevailed.

152. It may be useful at this point to furnish a brief summary of the principal Sanitary Acts which have been passed relating to the different parts of the United Kingdom.

In 1848 was passed the first great and comprehensive measure which may be called the groundwork of our sanitary legislation as regards England. The Public Health Act of 1848 was, however, principally designed for towns and populous places in England and Wales, not including the Metropolis, which was dealt with in Acts passed in the same year. The powers of local government supplied by the Act were generally an extension of those before given by sundry local Acts to Commissioners of Sewers in the metropolis, and to authorities in a few large towns. Many provisions corresponding to sections in the Towns Improvement Clauses Act of 1847 are found in the Public Health Act, and communities were thus enabled to obtain by a simple process powers which they could not previously obtain except by a local Act incorporating sections of the Towns Improvement Clauses Act.

In 1848 was also passed the Nuisances Removal and Diseases Prevention Act of that year, in substitution for a similar Act of 1846 which was about to expire; and in 1849 this Act of 1848 was amended. The provisions of all these three Acts extended to England, Scotland, and Ireland. In 1855 a comprehensive Nuisance Removal Act was, as regards England, substituted for the Acts passed in 1848 and 1849; and in the following year there was similar legislation for Scotland. In 1860 the English Act was amended, and in 1866, by the Sanitary Act of that year (to which we shall again refer) the provisions of the English Acts of 1855 and 1860, as then amended, were applied to Ireland.

In 1855 by the Metropolitan Local Management Act of that year, provision was made for the appointment of a medical officer of health and an inspector of nuisances by every vestry and district board in the metropolis. This provision did not extend to the City of London, where, in 1848, a medical officer of health had been appointed under power given by a local Act.

In 1858, the Local Government Act of that year, to be construed with the Public Health Act of 1848 as one Act, was passed, and took effect in all places where that Act was in force at the time of its passing; and, as regards England, these two Acts together constituted until 1872 the principal sanitary legislation on the statute book.

There followed, however, within the next ten years many public Acts having sanitary objects, some applying to all, and some to particular, parts of the United Kingdom, besides numerous other Acts of local application. We need only now specially refer to one of these public statutes, the Sanitary Act of 1866, which was probably the most important and applied, in part at least, to England, Scotland and Ireland. This Act, amongst other things, extended the powers of local authorities for the disposal of sewage and, in amending the English Nuisances Removal Acts of 1855 and 1860, added to the definitions of nuisances, especially as regards crowded houses and workshops, and to the duties and powers of local authorities for their abatement, especially in the way of providing means for disinfection and places for the reception of dead bodies.

In 1867 the Public Health (Scotland) Act was passed, a comprehensive measure which consolidated into one Act, with certain amendments, the whole statute law relating to the public health in Scotland.

In 1872 a complete distribution of England into sanitary districts took place, and some further amendments were made in the sanitary laws. In 1875 these laws were consolidated in the Act of that year. In 1891 a Sanitary Act was passed relating to the metropolis.

In 1874 an Act was passed for Ireland containing substantially the same provisions as those which had been enacted in the case of England in 1872.

153. We have seen, then, that if some changes have occurred tending to diminish mortality from small-pox, other changes have been simultaneously in progress tending in the contrary direction. We do not think it possible to strike the balance between



the two, and assert that it would tell in favour of a smaller mortality. In saying this we do not mean to indicate an opinion that sanitary improvements have been without an effect on small-pox mortality, but only that when all the changes which have occurred are considered it cannot be asserted that they afford an adequate explanation of the diminished mortality from small-pox.

154. If, however, improved sanitary conditions were the cause of the mortality from small-pox becoming less, we should expect to see that they had exercised a similar influence over almost all other diseases. Why should they not produce the same effect in the case of measles, scarlet fever, whooping-cough, and indeed any disease spread by contagion or infection and from which recovery was possible? Why should they not lead to these diseases also prevailing less, and to those attacked by them being better able to combat the disease?

155. We have had put before us no satisfactory answer to these questions. It has indeed been urged that whilst the diseases we have just mentioned almost exclusively affect children, small-pox largely attacks adults. We cannot feel that this circumstance is of much weight. It must be remembered that in former days small-pox was more fatal to children than to any other class. But apart from this we fail to see why improved sanitary conditions should enable children (and as we have said it is amongst them that the diminution of small-pox mortality has been greatest) to escape attacks of small-pox and overcome the disease rather than to escape from and overcome any of the other diseases to which we have referred.

156. In the case of measles there has not been during the period in question any diminution in the mortality corresponding with that displayed in the case of small-pox.

The following table shows the mortality from measles in England and Wales during each of the years 1838-1842 and 1847-1894. The figures for the years 1843-1846 are not available.

| Year.    | Deaths from Measles to every 100,000 living.           | Year.    | Deaths from Measles to every 100,000 living. |
|----------|--------------------------------------------------------|----------|----------------------------------------------|
| 1838 - - | 43                                                     | 1867 - - | 30                                           |
| 1839 - - | 71                                                     | 1868 - - | 53                                           |
| 1840 - - | 59                                                     | 1869 - - | 46                                           |
| 1841 - - | 43                                                     | 1870 - - | 34                                           |
| 1842 - - | 54                                                     | 1871 - - | 41                                           |
| 1843 - - | } Causes of death not abstracted by Registrar-General. | 1872 - - | 37                                           |
| 1844 - - |                                                        | 1873 - - | 32                                           |
| 1845 - - |                                                        | 1874 - - | 52                                           |
| 1846 - - |                                                        | 1875 - - | 26                                           |
| 1847 - - |                                                        | 1876 - - | 41                                           |
| 1848 - - | 51                                                     | 1877 - - | 37                                           |
| 1849 - - | 40                                                     | 1878 - - | 31                                           |
| 1850 - - | 31                                                     | 1879 - - | 36                                           |
|          | 40                                                     | 1880 - - | 48                                           |
| 1851 - - | 52                                                     | 1881 - - | 28                                           |
| 1852 - - | 32                                                     | 1882 - - | 48                                           |
| 1853 - - | 27                                                     | 1883 - - | 35                                           |
| 1854 - - | 50                                                     | 1884 - - | 42                                           |
| 1855 - - | 39                                                     | 1885 - - | 53                                           |
| 1856 - - | 37                                                     | 1886 - - | 43                                           |
| 1857 - - | 31                                                     | 1887 - - | 59                                           |
| 1858 - - | 48                                                     | 1888 - - | 35                                           |
| 1859 - - | 49                                                     | 1889 - - | 52                                           |
| 1860 - - | 48                                                     | 1890 - - | 44                                           |
| 1861 - - | 45                                                     | 1891 - - | 44                                           |
| 1862 - - | 48                                                     | 1892 - - | 46                                           |
| 1863 - - | 55                                                     | 1893 - - | 37                                           |
| 1864 - - | 40                                                     | 1894 - - | 39                                           |
| 1865 - - | 41                                                     |          |                                              |
| 1866 - - | 51                                                     |          |                                              |

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157. The following table shows the mortality from measles in Scotland during each of the years 1855-94:—

6, App.  
facing p. 641.

| Year.    | Deaths from Measles to every 100,000 living. | Year.    | Deaths from Measles to every 100,000 living. |
|----------|----------------------------------------------|----------|----------------------------------------------|
| 1855 - - | 43                                           | 1877 - - | 29                                           |
| 1856 - - | 37                                           | 1878 - - | 39                                           |
| 1857 - - | 36                                           | 1879 - - | 21                                           |
| 1858 - - | 54                                           | 1880 - - | 39                                           |
| 1859 - - | 33                                           |          |                                              |
| 1860 - - | 54                                           | 1881 - - | 27                                           |
|          |                                              | 1882 - - | 34                                           |
| 1861 - - | 33                                           | 1883 - - | 43                                           |
| 1862 - - | 47                                           | 1884 - - | 38                                           |
| 1863 - - | 74                                           | 1885 - - | 37                                           |
| 1864 - - | 37                                           | 1886 - - | 17                                           |
| 1865 - - | 39                                           | 1887 - - | 40                                           |
| 1866 - - | 34                                           | 1888 - - | 35                                           |
| 1867 - - | 44                                           | 1889 - - | 49                                           |
| 1868 - - | 37                                           | 1890 - - | 63                                           |
| 1869 - - | 52                                           |          |                                              |
| 1870 - - | 26                                           | 1891 - - | 44                                           |
|          |                                              | 1892 - - | 56                                           |
| 1871 - - | 63                                           | 1893 - - | 90                                           |
| 1872 - - | 28                                           | 1894 - - | 19                                           |
| 1873 - - | 43                                           |          |                                              |
| 1874 - - | 32                                           |          |                                              |
| 1875 - - | 30                                           |          |                                              |
| 1876 - - | 36                                           |          |                                              |

158. From the report on the census of Ireland in 1861 (Part III., vol. 2, page 20), we are able to obtain the number of deaths from measles ascertained by the census inquiries to have occurred in Ireland during each of the inter-censal periods 1831-41, 1841-51 and 1851-61. Calculating from these figures the average annual death-rate during each of these periods from measles, in the same way as the average annual death-rates for the same periods from small-pox (given in §140) were calculated, we find that the approximate average annual death-rate from measles in Ireland per 100,000 living was 38 during the inter-censal period 1831-41, 38 again during the inter-censal period 1841-51, and 22 during the inter-censal period 1851-61.

The materials for the following table, showing the mortality from measles in Ireland during each of the years 1864-94, have been obtained from the annual reports of the Registrar-General of Births and Deaths in Ireland.

| Year.    | Deaths from Measles to every 100,000 living. | Year.    | Deaths from Measles to every 100,000 living. |
|----------|----------------------------------------------|----------|----------------------------------------------|
| 1864 - - | 11                                           | 1880 - - | 20                                           |
| 1865 - - | 19                                           |          |                                              |
| 1866 - - | 15                                           | 1881 - - | 8                                            |
| 1867 - - | 24                                           | 1882 - - | 30                                           |
| 1868 - - | 23                                           | 1883 - - | 16                                           |
| 1869 - - | 17                                           | 1884 - - | 11                                           |
| 1870 - - | 18                                           | 1885 - - | 27                                           |
|          |                                              | 1886 - - | 6                                            |
| 1871 - - | 10                                           | 1887 - - | 27                                           |
| 1872 - - | 26                                           | 1888 - - | 40                                           |
| 1873 - - | 24                                           | 1889 - - | 12                                           |
| 1874 - - | 13                                           | 1890 - - | 15                                           |
| 1875 - - | 17                                           |          |                                              |
| 1876 - - | 12                                           | 1891 - - | 5                                            |
| 1877 - - | 29                                           | 1892 - - | 26                                           |
| 1878 - - | 41                                           | 1893 - - | 23                                           |
| 1879 - - | 16                                           | 1894 - - | 26                                           |



159. It will be seen that the death-rate from measles in all three countries has, as might be expected, varied considerably from year to year. Neither in England and Wales, nor in Scotland or Ireland, has that death-rate, however, shown any indication of a decline at all comparable with the decline in the death-rate from small-pox which has distinguished the period now under consideration; viz., in England and Wales the period from 1838 onward, in Scotland from 1865 onward, and in Ireland from 1841.

We find, indeed, as regards England and Wales, that though the death-rate from measles was higher in the three years 1838, 1839 and 1840 than it has been in any three consecutive years since, there has been no material decline in that death-rate during the years 1838-94. As regards Scotland, we find that there has been no material decline in the death-rate from measles during the years 1855-94. As regards Ireland we find that the death-rate from measles was on the whole considerably less during the inter-censal period 1851-60 than during the earlier inter-censal periods 1831-40 and 1841-50, but that there has since been no material decline in that death-rate.

160. The total effect, then, of the changes in sanitary conditions to which we have referred on the mortality from measles would seem, in England and Wales and in Scotland, to have been scarcely appreciable; and in Ireland to have been limited to a decline in the death-rate, trifling in amount in comparison with the decline in the death-rate from small-pox, and manifested, moreover, during a part only of the period of that decline.

161. The following table shows the mortality from scarlet fever and from diphtheria in England and Wales during each of the years 1838-1842 and 1847-1894. We are unable, for the earlier years included in the table, to separate those causes of death.

| Year.  | Deaths from<br>Scarlet Fever to<br>every 100,000 living. | Deaths from<br>Diphtheria to<br>every 100,000 living.   | Year.  | Deaths from<br>Scarlet Fever to<br>every 100,000 living. | Deaths from<br>Diphtheria to<br>every 100,000 living. |
|--------|----------------------------------------------------------|---------------------------------------------------------|--------|----------------------------------------------------------|-------------------------------------------------------|
| 1838 - | -                                                        | 38                                                      | 1867 - | -                                                        | 57                                                    |
| 1839 - | -                                                        | 67                                                      | 1868 - | -                                                        | 100                                                   |
| 1840 - | -                                                        | 126                                                     | 1869 - | -                                                        | 124                                                   |
|        |                                                          |                                                         | 1870 - | -                                                        | 145                                                   |
| 1841 - | -                                                        | 89                                                      |        |                                                          |                                                       |
| 1842 - | -                                                        | 79                                                      | 1871 - | -                                                        | 82                                                    |
| 1843 - | -                                                        |                                                         | 1872 - | -                                                        | 52                                                    |
| 1844 - | -                                                        | Causes of death not abstracted by<br>Registrar-General. | 1873 - | -                                                        | 56                                                    |
| 1845 - | -                                                        |                                                         | 1874 - | -                                                        | 105                                                   |
| 1846 - | -                                                        |                                                         | 1875 - | -                                                        | 85                                                    |
| 1847 - | -                                                        |                                                         | 1876 - | -                                                        | 69                                                    |
| 1848 - | -                                                        | 86                                                      | 1877 - | -                                                        | 59                                                    |
| 1849 - | -                                                        | 118                                                     | 1878 - | -                                                        | 75                                                    |
| 1850 - | -                                                        | 75                                                      | 1879 - | -                                                        | 69                                                    |
|        |                                                          |                                                         | 1880 - | -                                                        | 68                                                    |
| 1851 - | -                                                        | 76                                                      |        |                                                          |                                                       |
| 1852 - | -                                                        | 104                                                     | 1881 - | -                                                        | 55                                                    |
| 1853 - | -                                                        | 85                                                      | 1882 - | -                                                        | 52                                                    |
| 1854 - | -                                                        | 100                                                     | 1883 - | -                                                        | 47                                                    |
|        |                                                          |                                                         | 1884 - | -                                                        | 40                                                    |
| 1855 - | -                                                        | 89                                                      | 1885 - | -                                                        | 23                                                    |
| 1856 - | -                                                        | 71                                                      | 1886 - | -                                                        | 22                                                    |
| 1857 - | -                                                        | 65                                                      | 1887 - | -                                                        | 28                                                    |
| 1858 - | -                                                        | 121                                                     | 1888 - | -                                                        | 23                                                    |
| 1859 - | -                                                        | 98                                                      | 1889 - | -                                                        | 24                                                    |
| 1860 - | -                                                        | 49                                                      | 1890 - | -                                                        | 24                                                    |
|        |                                                          |                                                         |        |                                                          |                                                       |
| 1861 - | -                                                        | 45                                                      | 1891 - | -                                                        | 17                                                    |
| 1862 - | -                                                        | 73                                                      | 1892 - | -                                                        | 19                                                    |
| 1863 - | -                                                        | 148                                                     | 1893 - | -                                                        | 24                                                    |
| 1864 - | -                                                        | 142                                                     | 1894 - | -                                                        | 17                                                    |
| 1865 - | -                                                        | 84                                                      |        |                                                          |                                                       |
| 1866 - | -                                                        | 55                                                      |        |                                                          |                                                       |

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162. The following table shows the mortality from scarlet fever in Scotland during each of the years 1855-94 :—

| Year.    | Deaths from Scarlet Fever to every 100,000 living. | Year.    | Deaths from Scarlet Fever to every 100,000 living. |
|----------|----------------------------------------------------|----------|----------------------------------------------------|
| 1855 - - | 79                                                 | 1877 - - | 39                                                 |
| 1856 - - | 108                                                | 1878 - - | 53                                                 |
| 1857 - - | 79                                                 | 1879 - - | 44                                                 |
| 1858 - - | 94                                                 | 1880 - - | 59                                                 |
| 1859 - - | 126                                                |          |                                                    |
| 1860 - - | 101                                                | 1881 - - | 42                                                 |
|          |                                                    | 1882 - - | 42                                                 |
| 1861 - - | 60                                                 | 1883 - - | 35                                                 |
| 1862 - - | 43                                                 | 1884 - - | 33                                                 |
| 1863 - - | 115                                                | 1885 - - | 24                                                 |
| 1864 - - | 111                                                | 1886 - - | 27                                                 |
| 1865 - - | 75                                                 | 1887 - - | 30                                                 |
| 1866 - - | 89                                                 | 1888 - - | 18                                                 |
| 1867 - - | 104                                                | 1889 - - | 18                                                 |
| 1868 - - | 143                                                | 1890 - - | 19                                                 |
| 1869 - - | 136                                                |          |                                                    |
| 1870 - - | 4                                                  | 1891 - - | 18                                                 |
|          |                                                    | 1892 - - | 22                                                 |
| 1871 - - | 79                                                 | 1893 - - | 20                                                 |
| 1872 - - | 64                                                 | 1894 - - | 20                                                 |
| 1873 - - | 66                                                 |          |                                                    |
| 1874 - - | 186                                                |          |                                                    |
| 1875 - - | 137                                                |          |                                                    |
| 1876 - - | 68                                                 |          |                                                    |

163. As regards Ireland, obtaining from the report on the census in 1861 the number of deaths from scarlet fever ascertained by the census inquiries to have occurred during each of the inter-censal periods 1831-41, 1841-51, and 1851-61, and calculating, as before, from these figures the average annual death-rate during each period, we find that the approximate average annual death-rate from scarlet fever per 100,000 living was 10 during the inter-censal period 1831-41, 26 during the inter-censal period 1841-51, and 43 during the inter-censal period 1851-61.

The materials for the following table, showing the mortality from scarlet fever in Ireland during each of the years 1864-94, have been obtained from the annual reports of the Registrar-General of Births and Deaths in Ireland :—

| Year.    | Deaths from Scarlet Fever to every 100,000 living. | Year.    | Deaths from Scarlet Fever to every 100,000 living. |
|----------|----------------------------------------------------|----------|----------------------------------------------------|
| 1864 - - | 46                                                 | 1880 - - | 47                                                 |
| 1865 - - | 66                                                 |          |                                                    |
| 1866 - - | 63                                                 | 1881 - - | 26                                                 |
| 1867 - - | 39                                                 | 1882 - - | 24                                                 |
| 1868 - - | 49                                                 | 1883 - - | 35                                                 |
| 1869 - - | 66                                                 | 1884 - - | 28                                                 |
| 1870 - - | 55                                                 | 1885 - - | 23                                                 |
|          |                                                    | 1886 - - | 17                                                 |
| 1871 - - | 41                                                 | 1887 - - | 20                                                 |
| 1872 - - | 46                                                 | 1888 - - | 18                                                 |
| 1873 - - | 39                                                 | 1889 - - | 10                                                 |
| 1874 - - | 76                                                 | 1890 - - | 7                                                  |
| 1875 - - | 73                                                 |          |                                                    |
| 1876 - - | 42                                                 | 1891 - - | 7                                                  |
| 1877 - - | 21                                                 | 1892 - - | 9                                                  |
| 1878 - - | 20                                                 | 1893 - - | 10                                                 |
| 1879 - - | 32                                                 | 1894 - - | 13                                                 |

164. It will be seen that the death-rate from scarlet fever in all three countries has varied considerably from year to year. Neither in England and Wales, nor in Scotland or Ireland, has that death-rate, however, exhibited a decline comparable with the decline in the death-rate from small-pox which has distinguished the period now under



consideration, viz., in England and Wales the period from 1838 onward, in Scotland from 1865 onward, and in Ireland from 1841.

We find, indeed, that in England and Wales, in Scotland, and in Ireland, there was no sign of any decrease in the death-rate from scarlet fever until about 1880 or shortly before that year. During the last 10 to 12 years there has undoubtedly been in each part of the United Kingdom a marked decline in that death-rate. We think that the steps which have been taken in various ways to isolate persons suffering from scarlet fever have largely contributed to this decline.

165. We do not think it necessary to burden our report with similar details in reference to the mortality from whooping-cough during the period under discussion. It will be sufficient to say that there has been no decline in the mortality from that disease corresponding with the decline in small-pox mortality.

166. Great stress has been laid on the fact that the records of the Registrar-General show that the mortality returned under the head "fevers" has very largely diminished. But it is notorious that in comparatively recent years the nomenclature and classification of diseases where fever is present have undergone great changes, owing to improved diagnosis. In the case of many such diseases where the cause of death was formerly returned merely as "fever," it is now attributed to some other disease separately specified. The apparent diminution is therefore not entirely a real one. Changes in nomenclature and classification, however, cannot wholly explain the diminution in the number of deaths returned as due to fever, though they prevent exact quantitative comparison such as can be made in the case of diseases like small-pox, measles, &c. The mortality from fevers has undoubtedly decreased largely. In considering the relation of this decrease to improved sanitary conditions, it is important to advert to the nature of these sanitary improvements. They may be broadly classed as follows:—(a) Drainage, including in the term the removal of moisture from damp and swampy places, and the adequately rapid and effectual removal of the excreta of the bowels and the kidneys. (b) Ventilation of dwellings or the rapid and effective renewal of the air surrounding the inhabitants. (c) Lighting of dwellings. The means taken to secure this also entail greater ventilation; the two go together, but besides this the effect of light on organisms or microbes, to which contagia seem analogous, would lead one to suppose that increased light, at least sunlight, tended to destroy contagia. (d) A supply of pure water for drinking purposes. (e) Personal cleanliness. This, apart from its influence on general health, would have a tendency to render an individual less likely to receive contagion and less likely to convey it to another. (f) The increased general recognition, during the last 10 or 20 years especially, of contagion as the source of certain diseases, and increased knowledge of the means of avoiding its spread, may be recognised as a sanitary improvement of no slight value. It is obvious that these sanitary changes are not calculated to affect even all zymotic diseases in the same manner and to the same extent. The chief fevers are (1) malarial fevers, (2) typhus, (3) typhoid. There is much uncertainty concerning the fever classed as "simple continued," nor does this appear ever to have contributed largely to the returns. Now malarial fevers are directly dependent on the development of the contagia in swamps and marshes; when these are adequately drained the fevers disappear. Typhus fever, which seems to have furnished the largest share of "fevers" in the last and in the beginning of this century, is found to prevail in connexion with overcrowding in dark ill-ventilated dwellings, combined with deficient nutrition. When these conditions cease, the fever disappears, and typhus has thus become almost unknown in this country at the present day. Typhoid fever is directly dependent on the contagia furnished by the excreta of one case being introduced into the alimentary canal. Where, by means of adequate drainage and personal cleanliness, this is prevented, the disease is prevented also. In the case of each of these fevers, then, there are special circumstances developing the disease which sanitary improvements tend directly to remove. There is no like feature in the case of small-pox. It resembles measles in this, that the spread of it is not connected with any particular sanitary fault, as distinguished from those general conditions which tend to the spread of infectious disease. There is no evidence in the history of small-pox, either before or during the nineteenth century, to connect outbreaks of that disease in a special way either with imperfect removal of excreta, or with lack of air and light, or with deficient food, or with lack of personal cleanliness. Moreover, the general tendency of sanitation to lower the prevalence and the fatality of the disease is largely neutralised both in the case of small-pox and measles by the greater facility of intercourse. Whilst, then, there is



ample reason to regard the decrease in the case of typhus and typhoid fever (and it may perhaps be said of fever generally) as the result of improved sanitary conditions, since each of these is specially dependent on conditions which sanitary improvements have removed, there is no adequate reason to attribute the decrease of small-pox in the nineteenth century to a similar cause, though we fully recognise that sanitary improvements have had an effect in reducing the mortality from small-pox as from the other diseases to which we have just been referring. This view is strongly confirmed by the fact that in spite of sanitary improvements the mortality from measles and whooping-cough has remained undiminished, and the diminution in the mortality from scarlet-fever has only been apparent in comparatively recent years.

167. It has been maintained that the decline in small-pox mortality is largely due to more frequent and systematic attempts to isolate those suffering from small-pox. We think an answer to this contention is to be found in the fact that, as we shall presently show (§§ 460-479), it is only in quite recent years that there has been any systematic practice of isolating small-pox patients, and that it has been confined even then to a very limited number of localities. The fact to which we are about to call attention in greater detail than hitherto, that the decline in the deaths from small-pox is found almost exclusively among those of tender years, appears also to militate against the contention. The risk of contagion is not confined to children. Adults also are subject to it. If a better system of isolation had been a main cause of the reduced mortality, we should have expected to see it operate in the case of adults as well as of children. At the same time we are far from thinking, as will appear when we come to deal with that subject, that the efforts at isolation which have characterised recent years have been without a beneficial effect on small-pox mortality.

168. A study of the age incidence of small-pox mortality is very instructive. In connexion with this point it is necessary to bear in mind that experience has led to the conclusion that whatever be the protective effect of vaccination it is not absolutely permanent; the most convinced advocates of the practice admit that after the lapse of nine or ten years from the date of the operation, its protective effect against an attack of small-pox rapidly diminishes, and that it is only during this period that its power in that respect is very great, though it is maintained that, so far as regards its power to modify the character of the disease and render it less fatal, its effect remains in full force for a longer period and never altogether ceases. The experience upon which this view is founded is derived almost exclusively from the case of infantile vaccination. It has been supposed by some that the transitory character of the protection results from changes connected with the growth from infancy to adult years. Whether this be so or not, we have no means of determining.

169. No doubt when Jenner drew the attention of the public to the value of vaccination, he believed that a single successful inoculation of vaccine matter secured absolute immunity for the future from an attack of small-pox. It is certain that in this he was mistaken. It may well be doubted whether the anticipation was a reasonable one. No such immunity is secured by an attack of small-pox, though there are few who would maintain the proposition that it is without protective influence against another attack. *A priori* there would seem to be no sound ground for expecting that vaccinia would afford more potent protection than small-pox itself. The extent of the protection afforded (assuming that there is some protective influence) could only be determined by experience. It soon became apparent that Jenner had, in the first instance, over-rated the effect of vaccination. That he should thus have over-estimated it is not to be wondered at, when the tendency to be unduly sanguine, which besets the discoverer of any new prophylactic, and, indeed, every discoverer, is borne in mind.

*The changed  
age-incidence of  
fatal small-  
pox.*

170. The fact has been already noted that in the eighteenth century (and there is no satisfactory evidence that there was a difference in this respect in earlier centuries) small-pox was fatal chiefly to children; indeed, in particular local epidemics of which we have records, the mortality was confined entirely, or almost entirely, to that class of the population. Adults were at that time very largely protected by a previous attack of small-pox. Children were then the only class, for the most part, unprotected. During the present century this cause of protection has largely diminished; it is now only a very small section of the community which enjoys protection thus acquired. If, then, vaccination be most potent in its effect during the first few years after



the inoculation of the vaccine matter, we should expect to find the conditions which formerly existed reversed—children would be the best, adults the worst protected class.

171. Applying ourselves now to the statistics on this head, we find a remarkable change in the age incidence of small-pox mortality. The following table exhibits the change which has taken place in this respect. For the years 1848-54 cases of chicken-pox are unavoidably included, there being no means of distinguishing them. This, of course, tends to increase unduly the share of mortality borne by the earlier age periods, but the information which we possess with reference to chicken-pox mortality since mortality from that disease has been separately recorded, enables us to say that the error thus introduced cannot seriously affect the comparison. From 1855 onwards chicken-pox has been uniformly excluded, so that from that date there is nothing to affect it.

ENGLAND AND WALES : DEATHS from SMALL-POX at certain age periods to 1,000 deaths from small-pox at all ages.

| —       | Under 1. | 1-5. | 5-10. | 10-15. | 15-25. | 25-45. | 45 and upwards. |
|---------|----------|------|-------|--------|--------|--------|-----------------|
| 1848-54 | 251      | 426  | 130   | 33     | 75     | 67     | 18              |
| 1855-59 | 231      | 328  | 144   | 37     | 117    | 112    | 31              |
| 1860-64 | 237      | 313  | 108   | 42     | 123    | 133    | 44              |
| 1865-69 | 231      | 314  | 103   | 33     | 126    | 145    | 48              |
| 1870-74 | 143      | 169  | 140   | 58     | 200    | 224    | 66              |
| 1875-79 | 112      | 129  | 113   | 72     | 218    | 266    | 90              |
| 1880-84 | 113      | 122  | 98    | 68     | 216    | 286    | 97              |
| 1885-89 | 112      | 81   | 54    | 51     | 229    | 344    | 129             |
| 1890-94 | 166      | 117  | 50    | 26     | 131    | 338    | 172             |

The first point calling for notice is that in the period 1855-59, as compared with the earlier period, there was a considerable diminution in the share of small-pox mortality borne by those between one and five years of age. In the earlier period it was 426, in the latter 328. As regards those under one year of age the share fell from 251 to 231. It must, of course, be remembered that whatever the prevalence of vaccination amongst children the age-period under one year will always contain a considerable unvaccinated class. We are naturally led to inquire whether there is anything in the history of vaccination to account for the remarkable change we have adverted to. In the year 1853 vaccination was made compulsory, and though no sufficient means were provided for rendering the law effectual it cannot be doubted that it was calculated to increase vaccination in the subsequent years.

The next marked change is seen in the quinquennium 1870-74. The proportion of small-pox mortality borne by those under 1 year of age decreased from 231 to 143, and of those between 1 and 5 years of age from 314 to 169. We have already called attention to the fact that in 1867 power was given to the Guardians to appoint Vaccination Officers, and that advantage was taken of this from time to time by different Unions, though a large number remained without such officers until after 1871 when their appointment was made compulsory. There can be no doubt that the effect of this legislation was to cause an increasing extension of the practice of vaccination in 1868 and subsequent years, and very largely to increase the amount of vaccination in and subsequently to the year 1871. The effect of this would be at once felt in the earliest age-periods, and at a period correspondingly later in the succeeding age-periods. We have already pointed out the marked change in the incidence below 5 years of age in the quinquennium 1870-74, and it will be seen that in subsequent quinquennia there was a diminished incidence in the age-periods 5-10 and 10-15 and later still in the period 15-25. During the last quinquennium there has been some increase in the incidence of the disease in the first two life-periods. This has been coincident with some diminution in the practice of vaccination.

172. The following table shows the death-rates in England and Wales from small-pox per million living during the seven years from 1848-54, and for each decennium



since that period. It is to be remembered that, as already stated, the deaths for the years from 1848-54 include those from chicken-pox as well as small-pox :—

|             | Under 5. | 5-10. | 10-15. | 15-25. | 25-45. | 45 and upwards. |
|-------------|----------|-------|--------|--------|--------|-----------------|
| 1848-54 - - | 1,514    | 323   | 91     | 110    | 69     | 24              |
| 1855-64 - - | 788·8    | 209·5 | 68·7   | 118·9  | 87·8   | 36·2            |
| 1865-74 - - | 782·5    | 333·2 | 142·3  | 267·2  | 220·7  | 87·5            |
| 1875-84 - - | 127·8    | 62·9  | 46·4   | 82·4   | 76·6   | 33·9            |
| 1885-94 - - | 50·2     | 14·9  | 11·1   | 24·0   | 31·6   | 19·0            |

It will be observed that in the decennium 1855-64 there was a very large diminution of the mortality at the age-period under 5 years, a considerable though smaller diminution at the next age-period, and some diminution at the age-period from 10-15. Supposing the compulsory law of 1853 to have augmented to some extent infantile vaccination, its effect would be felt in the class under 5 years of age during the greater part of the decennium. It would affect the class aged 5-10 years during a smaller part of the decennium, and the class aged 10-15 only during the last year or two. The next decennium, 1865-74, included the years of the great epidemic, to which allusion has already been made. Its effects are apparent on most of the mortality rates of those years. As compared with the preceding decennium there was a very great increase of mortality at all the later age-periods. It is noteworthy that as regards those under 5 years of age the mortality was actually less, though very slightly so, than in the preceding decennium. And though there was increased mortality in the next age-period, the increase was less than in the later age-periods. It is impossible not to be struck by this fact when it is remembered that in 1867 and again in 1871, laws were passed calculated to increase the amount of infantile vaccination. The more stringent enforcement of the practice under these laws would considerably affect the class under 5 years of age during the decennium 1865-74, and the effect of the Act of 1867 would be felt to some though only to a slight extent in the class aged 5-10. Again in the next decennium, 1875-84, the fall was very great in the mortality in the first two age-periods; it was reduced to 127·8 and 62·9 as compared with 1,514 and 323 in the years 1848-54, or with 788·8 and 209·5, making the comparison with the decennium, 1855-64, when chicken-pox was not included. The results of the legislation of 1867 and 1871 would affect the class under 5 during almost the whole of this decennium, and would largely affect those in the next age-period. It would influence sensibly the class between 10 and 15 years of age and slightly the next higher age-period. It would be without effect in the classes over 25 years of age. We find the mortality rate in these classes 76·6 and 33·9, being actually higher than in the years 1848-54, for which the figures are 69 and 24, and not much below the figures for the next decennium, viz., 87·8 and 36·2. Comparing on the other hand the rates at the age-periods 10-15 and 15-25, the figures are 46·4 and 82·4 as against 91 and 110 for the years 1848-54, and 68·7 and 118·9 for the next decennium. In the decennium 1885-94 there was much less small-pox than in either of the preceding terms of years with which we have been dealing. Isolation and measures of that description were, no doubt, having their effect. The decrease was, however, largest in the age-periods which would be most affected by the results of the legislation to which we have directed attention. Comparing the first and last terms of years, the reduction in the first three age-periods was from 1,514, 323, and 91 to 50·2, 14·9, and 11·1, in the age-period 15-25 from 110 to 24, and in the two highest age-periods from 69 and 24 to 31 and 19 only.

173. It is right to observe that there must have been among those whose age exceeded 10 a certain number who had been re-vaccinated. The effect of this operation would be to restore protection, if protection there be, and to place the re-vaccinated in a somewhat similar relation to those of the same age who had been once vaccinated as vaccinated children bear to unvaccinated. It is not possible to ascertain the number of re-vaccinated persons in the class over 10 years of age in the two epochs respectively. But it seems clear that the mass of the people were not at either epoch re-vaccinated, and we do not think that the number of the re-vaccinated was sufficiently large to affect materially the value of any inferences to be drawn from the contrast to which we have directed attention. We may observe, however, that in discussing the effect of vaccination the question of re-vaccination will have to be considered, and that any



phenomena exhibited by the class of re-vaccinated persons, when compared with those of a similar age who have been only vaccinated in infancy, have a similar relevancy to the contrast afforded in the case of vaccinated and unvaccinated persons of a similar age.

174. It is not necessary to give in detail the statistics showing the change of age incidence in small-pox mortality in Scotland and Ireland. They exhibit the same general features.

There are, however, some particulars relating to Scotland which seem sufficiently important to deserve special notice. The following table was furnished by the Registrar-General of Births and Deaths in Scotland :—

DEATHS at VARIOUS AGES in SCOTLAND from SMALL-POX during the periods 1855-63 and 1864-87, and the proportion of such deaths at each age to every 1,000 deaths at all ages from the same disease, with the mean annual death-rate from SMALL-POX during those periods per 1,000,000 living at each age. 6, App 636.

| Period.                                                               | —                                                                               | All Ages. | 0-6 Mths. | 6-12 Mths. | 0-12 Mths. | 1-5 Years. | 5-10 Years. | 10-15 Years. | 15-25 Years. | 25-45 Years. | 45 Years and over. | Age not stated. |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------|-----------|------------|------------|------------|-------------|--------------|--------------|--------------|--------------------|-----------------|
| 1855-63.<br>(The nine years prior to the Vaccination Act.)            | Actual deaths in period - -                                                     | 8,807     | 1,227     | 1,345      | 2,572      | 3,639      | 795         | 222          | 627          | 688          | 256                | 8               |
|                                                                       | Proportion of deaths at each age to every 1,000 deaths at all ages - - - - -    | 1,000     | 139       | 153        | 292        | 413        | 90          | 25           | 71           | 78           | 29                 | —               |
|                                                                       | Mean annual death-rate during period per 1,000,000 living at each age - - - - - | 321       | —         | —          | 3,175      | 1,243      | 244         | 77           | 119          | 99           | 48                 | —               |
| 1864-87.<br>The twenty-four years subsequent to the Vaccination Act.) | Actual deaths in period - -                                                     | 9,240*    | 1,276     | 437        | 1,713†     | 1,265‡     | 881§        | 749          | 1,867        | 2,137        | 624                | 12              |
|                                                                       | Proportion of deaths at each age to every 1,000 deaths at all ages - - - - -    | 1,000     | 138       | 47         | 185        | 137        | 95          | 81           | 202          | 231          | 67                 | —               |
|                                                                       | Mean annual death-rate during period per 1,000,000 living at each age - - - - - | 108       | —         | —          | 679        | 139        | 86          | 81           | 115          | 100          | 38                 | —               |

\* This 9,240 includes 59 deaths from chicken-pox.  
† " 1,713 " 38 " (20 of them being included in the 1,276 deaths under six months, and 18 in the 437 deaths between six and twelve months.)  
‡ This 1,265 includes 19 deaths from chicken-pox.  
§ This 881 includes 2 deaths from chicken-pox.

It will be observed that the proportion of deaths borne by those under six months, who would be in both periods (substantially) an unvaccinated class, was almost exactly the same, whilst the proportion borne by those between six months and a year, and between one and five years of age, was greatly diminished. There was a slight increase in the proportion of those between five and ten years, but this was due to the very large decrease of the proportion borne by those of an earlier age and not to any increase of the mean mortality in the class aged 5-10 in the later period, for the mean annual death-rate per million living fell greatly, viz., from 244 to 86. Above the age of ten, the mean annual death-rate remained about the same. There was a small increase in the ages 10-15 and a small decrease in the ages 15-25.

175. Specially valuable information bearing on the protective influence of vaccination is, we think, to be found in the careful and scientific investigations which have been instituted in the case of several recent local epidemics. The first of these was the work of Dr. Barry during the Sheffield epidemic of 1887-8. This inquiry was made at the instance of the Local Government Board, Dr. Barry being one of the Board's medical inspectors. Five others have been conducted by medical men appointed by ourselves. Dr. Coupland reported on the epidemics in Dewsbury and Leicester, which took place in 1891-2 and 1892-3 respectively; Dr. Luff on outbreaks in London in 1892-3; Dr. Savill on an epidemic which visited Warrington in 1892-3; and Dr. Coupland on an epidemic in Gloucester in 1895-6.

*Inquiries as to six recent local epidemics of small-pox.*

176. We now proceed to consider the evidence derived from these reports so far as it bears on the age incidence of small-pox mortality. In the first place, we may notice the interesting comparison in this respect, to which Dr. Barry called attention, between the epidemic at Sheffield in 1887-8, which he investigated, and previous epidemics which had visited that town.

*The age-incidence of fatal small-pox in these epidemics.*



Q. 2047.

177. During the 1857-8 epidemic out of every 100 small-pox deaths among people of all classes the share borne by children under 10 years of age was 85, as against 15 borne by persons of 10 years and upwards. During the 1863-4 epidemic the share borne by the class under 10 years was 86, as against 14 borne by the class over 10 years of age. During the 1868-9 epidemic the share borne by the class under 10 years of age was 84, as against 16 borne by the class above that age. During the 1871-2 epidemic the share borne by the class under 10 years of age was 64, as against 36 borne by the class above that age. During the 1887-8 epidemic the share borne by the class under 10 years of age was 27, as against 73 borne by the class above that age.

178. The per-centage of the total deaths from small-pox of those dying between the ages 0-10 amongst the population enumerated in the census at Sheffield in 1887-8 was 25·6. This per-centage is calculated upon a total of 500 deaths, of which the deaths of those in that age period were 128. The particulars are contained in Tables XCVI. and XCIV., pp. 178 and 176 of Dr. Barry's report, which were compiled from the census taken in February 1888 and included all the deaths which had occurred up to the end of the enumeration. Inasmuch, however, as Dr. Barry excluded from Table XCVI.\* all deaths of children under one month, these have been added so that for the purposes of comparison the basis of the statistics relating to Sheffield and the other towns should be the same.

App. III.,  
p. 29. 179. In Dewsbury in 1891-2 the deaths between the ages of 0-10 were 57 out of a total of 110, or 51·8 per cent. of the total deaths.

App. IV.,  
pp. 2 and 12. 180. In London in 1892-3 the deaths between the ages of 0-10 were 67 out of 182, or 36·8 per cent. of the total deaths.

App. V.,  
p. 35. 181. In Warrington in 1892-3 the deaths between the ages of 0-10 were 14 out of 62, or 22·5 per cent. of the total deaths.

App. VI.,  
p. 43.; and  
pp. 26 and 27. 182. In Leicester in 1892-3 the deaths between the ages of 0-10 were 15 out of 21, or 71·4 per cent. of the total deaths. In consequence of the proximity of a scarlet fever ward to the hospital in which small-pox cases were treated, several children in that ward were attacked by small-pox, of whom three died. It may be suggested that this circumstance would be likely to render the infant mortality exceptionally high at Leicester as compared with the other towns. If, however, these three deaths be excluded altogether from the calculation, it only reduces the per-centage from 71·4 to 66·6.

App. VII. 183. In Gloucester in 1895-6 the deaths between the ages of 0-10 were 280 out of 434, or 64·5 per cent. of the total deaths.

184. It will be convenient for purposes of comparison to place them together in the following table:—

|            |         | Per-centage of the Total Small-pox Deaths borne<br>by those between the Age of 0-10. |
|------------|---------|--------------------------------------------------------------------------------------|
| Warrington | - - - - | 22·5                                                                                 |
| Sheffield  | - - - - | 25·6                                                                                 |
| London     | - - - - | 36·8                                                                                 |
| Dewsbury   | - - - - | 51·8                                                                                 |
| Gloucester | - - - - | 64·5                                                                                 |
| Leicester  | - - - - | 71·4 [or 66·6. See § 182.]                                                           |

185. It will be seen that whilst at Leicester and Gloucester the deaths under 10 years of age were considerably more than half the total deaths, the deaths of children of a similar age at Dewsbury slightly exceeded one half. In London the deaths under 10 were considerably less than half. At Sheffield and Warrington they were about a quarter

\* Note.—We have in this (§178) and the following paragraphs referred to the particulars contained in this table (Table XCVI.) rather than to those found in the table based upon the records in the Health Office (which is Table CI. on page 191 of the report), because as regards most of the matters with which we are concerned, at all events, it seems more to be relied on. If the figures relating to age incidence be taken from the latter table the per-centage of deaths at the ages 0-10 works out at 26·9.



of the total deaths. The variations are very striking, ranging from 22·5 at Warrington to 71·4 at Leicester, and the approximation between the per-centages at Sheffield and Warrington, as compared with those of the other towns, is also worthy of note. One is naturally led to inquire what is the explanation of these remarkable differences in the age incidence of the fatal cases of small-pox?

186. According to Dr. Savill, the requirements of the law with reference to vaccination had been very well complied with in Warrington, and the per-centage of the population unvaccinated was very small. Dr. Barry's report with regard to the vaccination of Sheffield is to the same effect.

187. Turning to the returns of vaccination in Sheffield for the years 1878-87, we find that the children not finally accounted for (including cases postponed) amounted during that period to 4·5 of the births.

The return for the Union of Warrington (which includes the borough) shows for the 10 years 1883-1892 that the children not accounted for (including, as before, postponed cases) was 4·8 per cent. of the births.

There was probably not much difference between the condition of Sheffield and Warrington as regards vaccination, though it is of course not possible to ascertain with perfect accuracy their relative position in this respect.

188. In London there had been a considerable falling off in the amount of vaccination for some years prior to 1892. In 1883 the per-centage of births left unaccounted for (including, as before, the postponed cases) was 6·5. It was not materially different in the following year. In 1885 it had increased to 7 per cent.; in 1886 to 7·8; in 1887 to 9 per cent.; in 1888 to 10·3 per cent.; in 1889 to 11·6 per cent.; in 1890 to 13·9 per cent, and in 1891 to 16·4 per cent. Taking these years together, the per-centage left unaccounted for is 9·9. The per-centages we have given are derived of course from a very large number of births, so that the increase in the number appearing thus to be left unvaccinated is very considerable. Thus in the year 1883 the number unaccounted for was 7,816, whilst in 1891 it was 19,806. There seems to be no doubt, therefore, that, so far as regards the class under 10 years old, London compared unfavourably as regards the amount of vaccination both with Warrington and Sheffield.

189. In Dewsbury vaccination had been greatly neglected. In the year 1882 the per-centage of children born and unaccounted for was 12·6. In 1883, 20·0; 1884, 37·6; 1885, 47·2; 1886, 37·5; 1887, 29·6; 1888, 32·2; 1889, 37·3; 1890, 39·1; 1891, 32·5; 1892, 37·7. Taking these years together, the per-centage is 32·3. It will thus be seen that the child population of Dewsbury was in a condition less vaccinated than that of London.

190. In Leicester, the practice of vaccination had been very largely abandoned for some years prior to the epidemic.

In the years preceding the epidemic the per-centages of births left unaccounted for were as follows:—

|      |   |   |      |      |   |   |      |
|------|---|---|------|------|---|---|------|
| 1883 | - | - | 43·8 | 1888 | - | - | 77·0 |
| 1884 | - | - | 47·9 | 1889 | - | - | 79·8 |
| 1885 | - | - | 52·1 | 1890 | - | - | 78·7 |
| 1886 | - | - | 69·1 | 1891 | - | - | 79·9 |
| 1887 | - | - | 72·2 | 1892 | - | - | 80·1 |

191. In Gloucester, as in Leicester, the practice of vaccination fell into disuse for some years prior to the epidemic, in the ten years preceding which the per-centages of births left unaccounted for were as follows:—

|      |   |   |      |      |   |   |      |
|------|---|---|------|------|---|---|------|
| 1885 | - | - | 10·6 | 1890 | - | - | 83·2 |
| 1886 | - | - | 18·1 | 1891 | - | - | 84·7 |
| 1887 | - | - | 58·8 | 1892 | - | - | 86·9 |
| 1888 | - | - | 79·3 | 1893 | - | - | 86·0 |
| 1889 | - | - | 83·2 | 1894 | - | - | 85·1 |

192. We thus find that with a well-vaccinated child population, such as that of Warrington or Sheffield, the proportion of the total deaths borne by that class was very small.



In Leicester and Gloucester, where the child population was very ill vaccinated, the proportion of deaths borne by that class was very large; whilst in London and Dewsbury the proportion of the total mortality borne by children lay between the rates at Warrington and Sheffield on the one hand and Gloucester and Leicester on the other, being considerably higher in Dewsbury (which as regards vaccination was in closer approximation to the condition of Gloucester and Leicester) than in London. If the proposition that vaccination has a very potent protective influence for 9 or 10 years be a sound one, the difference in the degree of vaccination of the child population in the several towns at the time when they were visited by the epidemics would account for the particular phenomena we have been examining.

193. We cannot but lay stress upon the facts thus revealed by the investigation of recent epidemics in these six towns. These facts are not open to the same chance of error as is involved in a comparison of the mortality among persons said to be vaccinated or unvaccinated. The age at which deaths occur may be said to be practically a matter of certainty, whilst the proportion of deaths below a given age to deaths above that age is free from liability to error. And even if the proportion of vaccinated to unvaccinated children under 10 be not capable of precisely accurate ascertainment, there can be no doubt that the proportion was very great in Warrington and Sheffield and very small in Gloucester and Leicester, whilst in London and Dewsbury it lay somewhere between the two; and the proportion of the unvaccinated in Dewsbury may with confidence be asserted to have been greater than in London.

194. We have said that the phenomena are accounted for on the supposition that vaccination has the protective influence alleged. Is there any other satisfactory explanation of them? It is argued that improved sanitary conditions would tend to diminish the mortality amongst children, but if this were the explanation similar changes of age incidence ought to be seen in the mortality from all other diseases. This, however, is not the case.

195. Reverting to the statistics for England and Wales, it appears from the figures given in the reports of the Registrar-General that the proportion of the total mortality from measles, whooping-cough, and scarlet fever respectively borne by children has remained almost uniform, the variations have been very trifling. In the case of Scotland also, whilst the same change in the age incidence of small-pox mortality is to be observed, there, as in England and Wales, no similar change of age incidence is to be found in the mortality from measles, scarlet fever, or whooping-cough.

196. In Sheffield the age incidence has scarcely varied in the case of measles and scarlet fever, and only slightly so in the case of whooping-cough during the last 30 years, and there is no reason to think that the circumstances are materially different in this respect in any of the other towns with the epidemics in which we have been dealing.

197. It has been suggested that small-pox is specially amenable to improved sanitary conditions, and that this appears from the influence which they have in diminishing the proportion in which those under five years of age die of small-pox in healthy districts as compared with towns, where the sanitary conditions are inferior. In proof of this reliance is placed on a comparison of two tables of mortality, showing of what diseases and at what ages a million live-born children might be expected to die, which appeared in a supplement to the 35th annual report of the Registrar-General, the one derived from a Liverpool life-table and the other from a life-table for certain selected "healthy districts" in different parts of England and Wales. The tables were, in the main, based on the experience of the years 1861-1870, and, of course, assume that the conditions which then obtained would remain unchanged. It is quite true that it appears from these tables that whilst in Liverpool the per-centage of deaths from small-pox expected under 5 years of age was 63·5, in "healthy districts" it was only 25·5. But in order to judge whether this difference (so far as it really represents a different incidence of fatal small-pox on the ages under and over five) can be attributed to the superior sanitary conditions of what are termed the "healthy districts" it is necessary to define what is meant by sanitary conditions and also to see how the case stands with regard to other diseases. A supply of pure water, good drainage, sufficient light and air and cleanliness, these and the like are usually regarded as the elements



which render one area superior to another in its sanitary condition. Different areas may be better or worse in these respects or some of them, and this superiority may largely influence zymotic disease.

But in relation to diseases of this class there are other respects in which a great town differs from rural districts. In the former a large population is collected in close proximity, whilst in rural districts the population is scattered over a wide area, and the people collected in close proximity are comparatively few in number. The necessary effect of this, as we shall presently show, is that the cases of zymotic disease would be more numerous in the former area than in the latter districts, and that as regards certain zymotic diseases, a larger proportion of the deaths would occur under five years of age.

In the case of whooping-cough, according to the tables referred to, whilst the per-centage of deaths under five to be expected in "healthy districts" was 94·2, in Liverpool it was 95·6, or not substantially different. The explanation of this is not far to seek. Whooping-cough rarely causes death in persons over five years of age, the share borne by that class is therefore the same whatever the sanitary condition of the districts in which they occur, though the disease may be more frequently epidemic in large towns than in the country.

Again, if we turn to the heading "fevers," the per-centage of the expected mortality under five is only 12·1 in Liverpool as compared with 9·1 in healthy districts, yet it can hardly be doubted that fever is a form of zymotic disease affected in a special degree by sanitary conditions. It must be remembered, too, that, just as in the case of whooping-cough, the disease is seldom fatal to those above five years of age, in the case of "fevers" the disease is seldom fatal below that age.

Passing now to the headings "measles" and "scarlatina" in the same table, we find in the case of measles the variation in the per-centage borne by children under five is 94·5 in Liverpool, as compared with 76·0 in "healthy districts." It is a disease to which all persons who have not suffered from it are liable, but it is rarely fatal except in the case of the young. In great towns where measles are more frequently epidemic than in rural districts, more children under five years of age will be exposed to the infection of the disease, whilst in districts in which epidemics are not so frequent and the epidemics may occur at intervals of only five years or more, more children will be for the first time exposed to the infection above the age of five years. It was to be expected, therefore, that the proportion of deaths under five years of age would be greater in a large town than in what are termed healthy districts. The same considerations, so far as the recurrence of epidemics is concerned, apply to the case of scarlatina, and the table shows that the per-centage of the expected mortality under five from this disease is in healthy districts 53·1, and in Liverpool 70·0.

A consideration of the facts to which we have been calling attention, appears to us sufficient to show that sanitary conditions do not affect the proportion which the mortality of children under five years of age bears to the total mortality from zymotic diseases unless amongst sanitary conditions that which constitutes the essential difference between towns and rural districts is included. In a town where large numbers are gathered in close proximity the chances of contracting an epidemic disease are necessarily greater than in a rural district where the population is distributed over a wide area in which no large numbers are anywhere living in close proximity. If a difference such as this is to be included amongst sanitary conditions a few badly-drained, ill-ventilated houses remote from other habitations would have to be regarded, as in some respects, in a superior sanitary condition to the best drained and ventilated houses in a large town. A use of the expression "sanitary conditions" which involves such a consequence appears to us to be an abuse of it.

Reverting to the case of small-pox the observations already made in relation to other diseases are, in our opinion, one explanation of the disparity in the expected mortality under five from that disease in Liverpool as compared with healthy districts. In a large town small-pox may be almost constantly present, and frequently become, epidemic. In a country district it may be more rarely present and affect only a particular part of the district. It is to be expected, therefore, that more persons over the age of five years would be susceptible and liable to contract the disease in the case of the latter area than of the former.

In addition to the points to which we have invited attention there is another matter which must be remembered. The comparison made between Liverpool and "healthy districts" necessarily involves a fallacy unless it be borne in mind that, of a million born alive, a much larger number will attain ages beyond five years in "healthy



“districts” than in a large town like Liverpool. The tables referred to show that, whilst in “healthy districts” 175,410 are expected to die below five years of age, in Liverpool the number is no less than 460,370. 824,590 are, therefore, estimated as living beyond the age of five years in “healthy districts” as compared with 539,630 in Liverpool. It is obvious, therefore, that in the case of a disease like small-pox, which attacks and is fatal at all ages, it was to be expected that a much larger proportion of the deaths should occur at ages above five years in “healthy districts” than in Liverpool. In the case of a disease like whooping-cough, which is hardly ever fatal to those above five years of age whether in town or country, the difference in the expected survival beyond that age in the districts compared is of no practical importance. An observation of the same kind applies, though, of course, in a less degree, both to measles and scarlatina. In the case of “fevers,” though the cause referred to would lead us to anticipate a larger proportion of deaths above 5 years of age in healthy districts than in Liverpool, the comparison loses much of its value owing to the fact that such a fever as typhus is far more prevalent in a large town like Liverpool than in a “healthy district;” the “fevers,” therefore, which are contracted in the two cases are almost certainly not the same.

198. It has been suggested that the change in the age incidence of small-pox, to which we have referred, is deprived of its importance by the fact that a similar change is to be observed in the case of mortality from “fevers.” We have already called attention to the fact that the deaths which have occurred from “fevers” at different times do not admit of the same comparison as the deaths due at different epochs to small-pox owing to changes of nomenclature and diagnosis. Prior to 1869, for example, the term “fever” in the records of the Registrar-General included typhus fever, infantile fever, and remittent fever. Enteric fever was not recognised statistically. There was then a new departure: infantile fever disappeared from the records of the Registrar-General, and remittent fever (so far as children 0-5 were concerned) was classed with enteric fever. Since 1880, however, remittent fever deaths, ages 0-5, have been transferred to malarial diseases. So far we have dealt with classification, but there can be no doubt that in recent years better diagnosis has led to the same disease being returned under a different designation to that which would have been employed at an earlier period. For example, causes of death are now certified as tuberculous which would formerly have been returned as typhoid. But taking the cases of deaths since 1871 recorded as due to typhus and typhoid fevers we find no change of age incidence of the slightest importance until the quinquennium 1881-85. The per-centage of deaths under five to deaths at all ages for four successive quinquennia are as follows:—

| —       |   |   |   | 1871-75. | 1876-80. | 1881-85. | 1886-90. |
|---------|---|---|---|----------|----------|----------|----------|
| Typhus  | - | - | - | 6.4      | 6.1      | 3.5      | 3.4      |
| Typhoid | - | - | - | 17.4     | 16.0     | 9.3      | 7.5      |

It will be seen that not only, as already noted, was there no substantial change until 1881-85, but that the fall was suddenly large, and that since that time there has been no considerable change in the age incidence. The phenomena would certainly seem to point to the conclusion that the change is at all events largely due to the causes already referred to. There has certainly been no change in the age incidence of these diseases which can be said to correspond with the change in the age incidence of small-pox to which we have called attention.

199. It has been suggested that, comparing the deaths registered as due to influenza per million living at separate age-periods during the epidemics of 1847-48 and 1890-91, a change of age-incidence is found parallel to that to which we have called attention in the case of small-pox. A comparison of this kind, relating as it does in each case to the effect of the epidemic in two years only, appears to us of little or no value. Moreover, whilst the comparison shows a considerable diminution in the deaths under 10 years of age in the epidemic of 1890-91, as compared with the epidemic 1847-48, and a small decrease in the case of those between 10 and 15, there was not an increase in the later epidemic in the case of all those above 15 years of age. The increase was great as regards those between 15 and 45 years of age, and there was some increase



up to 65 years of age, but above that age there was again a considerable decrease. In addition to this, it must be borne in mind that during an epidemic of influenza many deaths which have their origin in that disease are ascribed to pneumonia, bronchitis, heart-disease, and other secondary effects of influenza. It is impossible to tell whether in the case of the two epidemics the same proportion of deaths were attributed to these secondary causes, and whether the deaths were thus attributed uniformly at all ages.

200. A comparison has been made of the total share of the small-pox mortality of children under five of all classes with the share of the small-pox mortality of unvaccinated persons borne by children under five years of age, for the quinquennium 1886-1890, for the purpose of showing that the per-centage borne by unvaccinated children does not materially differ from that of all classes at all ages. This comparison is, however, quite valueless, for of the deaths at all ages in the case of more than one half it is not stated whether they were vaccinated or not. Of those in which the condition as to vaccination was not stated, the whole number or the greater part may, as far as appears, have been unvaccinated. Moreover, in the comparison thus made, considerably more than half of the deaths under five of all classes treated as deaths from small-pox were deaths returned as from chicken-pox.

201. Apart from the difference in the extent of vaccination, no cause has been suggested at all adequate to account for the variations in the age incidence of fatal small-pox upon which we have been dwelling. It is not only that it is seen at different epochs equally prominent in England and Wales, Scotland and Ireland, but a striking contrast in the proportion of mortality below and above 10 years of age is witnessed also at the same epoch in different towns where small-pox happened to become epidemic—places which differ, so far as is known, only in this, that the extent of vaccination amongst the child population was different. If improved sanitation were the cause of the diminished mortality amongst children, in proportion to that borne by those of older years, it is quite impossible to understand how its effect should have varied so greatly in these different towns, and why in Gloucester and Leicester the mortality from the disease should have been so largely amongst children, approaching in that respect the experience of the epoch preceding vaccination.

202. We proceed now to consider the evidence derived from a comparison of the fatality of small-pox as it has affected the vaccinated and unvaccinated respectively. The most important information on this head is undoubtedly to be found in the reports upon recent epidemics to which we have already referred. Great pains were taken to ascertain the condition as to vaccination of the persons attacked, and the results are shown, not merely at all ages, but at different age periods. We shall deal, therefore, in the first place with the facts recorded in those reports, though they are later in date than other statistical records which will be noticed hereafter.

*The fatality of small-pox amongst vaccinated and unvaccinated in the six epidemics.*

203. It may be convenient at the outset to point out that per-centages are of comparatively little value unless the number which is converted into a per-centage be substantial. If, for example, it were found that of two persons attacked, one died, it would be as unsafe to assume that 50 per cent. was the normal fatality of the disease, as it would be, if both died, to assume that it was always fatal, or if neither died, that it never was so. The observation we have made as to the value of per-centages, though stated in this connexion, applies of course to all cases in which per-centages are taken.

204. Commencing with the earliest of the reports, that relating to Sheffield, we find that at all ages, of 4,151\* vaccinated persons in the enumerated population of Sheffield attacked by small-pox up to the date of the census, 200, or 4·8 per cent., died of that disease. Of 552\* unvaccinated persons in the enumerated population attacked by small-pox up to the same date 274, or 49·6 per cent., died of the disease, so that relatively to their number, and apart from any question of age, for each individual vaccinated person suffering from a fatal attack of small-pox, 10·3 unvaccinated persons were fatally attacked by that disease.

Q. 1976.

Of 353 vaccinated children under 10 years of age in the enumerated population attacked by small-pox up to the same date, 6, or 1·7 per cent., died of the disease. Of 228 unvaccinated children attacked by small-pox up to the same date 100, or 43·9 per cent., died of the disease, so that relatively to their numbers for each individual vaccinated child from 0-10 years of age suffering from a fatal attack of small-pox, 25·8 unvaccinated children were fatally attacked by that disease.

\* Note.—The age of 24 of the 4,151 vaccinated, and of two of the 552 unvaccinated, persons attacked was not ascertained. The figures, therefore, in the second and third paragraphs of § 204 do not exactly correspond with those in the first paragraph.



Of 3,774 vaccinated persons over 10 years of age in the enumerated population attacked by small-pox up to the same date 194, or 5·1 per cent., died of the disease. Of 322 unvaccinated persons over 10 years of age in the enumerated population attacked by small-pox up to the same date 174, or 54·2 per cent., died of the disease, so that relatively to their numbers, for each individual vaccinated person, aged 10 years and upwards, suffering from a fatal attack of small-pox 10·6 unvaccinated persons of a similar age were fatally attacked by that disease. The same features are, broadly speaking, indicated in a comparison of the fatality amongst the vaccinated and unvaccinated in different districts of Sheffield. The per-centages differ somewhat, and in some districts the numbers are too small for a per-centage rate to be of much value, but they all have this feature in common, that the fatality amongst the unvaccinated is distinctly in excess of that amongst the vaccinated.

Q. 19,349-20,200 ; 20,489-759. 205. The facts recorded by Dr. Barry have been subjected to a severe scrutiny by the opponents of vaccination, but they have not, in our opinion, been materially displaced. It has been shown that three or four of those attacked have been included in the class of unvaccinated who ought to have been placed in the vaccinated class, but, on the other hand, it is probable, as Dr. Barry suggests, that of the doubtful cases which have been included amongst the vaccinated, quite as many ought to have been transferred from the vaccinated to the unvaccinated class. Many were put in the vaccinated class of whose vaccination there was very meagre evidence. Some, no doubt, may have been vaccinated after the date of the census, in which they were enumerated as unvaccinated. Making full allowance for this, we do not think it would modify the conclusion that the fatality was much higher amongst the unvaccinated than the vaccinated. It is obvious that a considerable transfer might be made from the one class to the other without altering the result in this respect.

Q. 29,345. Q. 29,345-74.

App. IV., pp. 2-5, and 12-15. 206. In the outbreak of small-pox in London in 1892-3, of the vaccinated under 10—110 were attacked, none of whom died. Of the unvaccinated of a similar age, 228 were attacked, of whom 61 died, or 26·7 per cent. Of the vaccinated over 10 years of age, 1,643 were attacked, of whom 39 died, or 2·3 per cent. Whilst of 181 unvaccinated of a similar age who were attacked, 38 died, or 20·9 per cent.

Dr. Luff, when comparing in his report the fatality amongst the vaccinated and unvaccinated, dealt only with the persons undoubtedly falling within one or other of those classes, discarding all the doubtful cases. Of these cases 20 were under 10 years of age, with 6 deaths. Over 10 there were 171 cases with 38 deaths. It will be seen that the fatality in these doubtful cases was high, especially amongst those under 10 years of age. The contrast between the fatality in this doubtful class of 20 and that in the class of the undoubtedly vaccinated 110, of whom none died, is very striking. The probability is great that as regards children under 10 years of age, unless where the eruption was such as to obscure the marks, the absence of any mark of vaccination indicates that the operation has never been successfully performed. Adding, however, all these doubtful cases to the vaccinated class the figures are as follows:—

Of the vaccinated under 10, 130 were attacked, of whom 6 died, or 4·6 per cent., as compared with 26·7 per cent. in the unvaccinated class. Of the vaccinated over 10 years of age, 1,814 were attacked, of whom 77 died or 4·2 per cent., as compared with 20·9 per cent. in the unvaccinated class.

App. III., p. 114. 207. In Dewsbury 44 vaccinated children under 10 were attacked, of whom 1, or 2·2 per cent., died. Of 174 unvaccinated children of a similar age, 56, or 32·1 per cent., died. One child under 10 years of age, who did not die, is classed under the heading “alleged vaccination.” If this case be added to the vaccinated class, the figures are 45 persons attacked, of whom 1, or 2·2 per cent., died. Of 577 vaccinated persons attacked who were over 10 years of age, 15, or 2·6 per cent., died. Of 192 unvaccinated persons of a similar age attacked, 36, or 18·7 per cent., died. Twenty-four persons over 10 years of age are classed under the heading “alleged vaccination.” Of these two died. If the cases thus classified be added to the vaccinated class they would only alter the per-centage to 2·8; the figures being 601 attacks with 17 deaths.

We have thought it well here and elsewhere to include in the unvaccinated class those described as “under vaccination.” They appear properly to belong to it, and as their inclusion, though not making a material difference, tells on the whole in favour of the unvaccinated class as compared with the vaccinated, it seems fairer to take that course. Doubtful cases have been included in the vaccinated class.

App. V., pp. 51 and 43. 208. In Warrington, of 33 vaccinated children under 10 years of age, two died, or 6 per cent. Of 32 unvaccinated children of a similar age, 12 died, or 37·5 per cent. Of



560 vaccinated persons over 10 years of age, 36 died, or 6·4 per cent. Of 36 unvaccinated persons of a similar age 12 died, or 33·3 per cent.

209. At Leicester two vaccinated children under 10 were attacked, neither of whom died. Of unvaccinated children of a similar age, 107 were attacked, of whom 15, or 14·0 per cent., died. Of vaccinated persons over 10 years of age, 197 were attacked, of whom two died, or 1·0 per cent. Of the unvaccinated of a similar age, 51 were attacked, of whom four, or 7·8 per cent., died. App. VI,  
p. 45.

210. At Gloucester 26 vaccinated children under ten were attacked, of whom one, or 3·8 per cent., died. Of unvaccinated children of a similar age 680 were attacked, of whom 279, or 41·0 per cent., died. Of vaccinated persons over ten years of age, 1,185 were attacked, of whom 119, or 10·0 per cent., died. Of the unvaccinated of a similar age, 88 were attacked, of whom 35, or 39·7 per cent., died. App. VII.

211. The history of the disease shows us that small-pox epidemics vary from time to time in the degree of their fatality quite apart from any question of vaccination. If the death-rate in relation to attacks be compared in the six towns, in the case of those over 20 years of age, a class which was in those towns probably in about the same condition as regards vaccination, it will be seen from the following table that the variations were considerable:—

|                                       | Persons over 20 years of age only. |         |           |
|---------------------------------------|------------------------------------|---------|-----------|
|                                       | Attacks.                           | Deaths. | Fatality. |
| Gloucester - - - -                    | 962                                | 135     | 14·0      |
| Sheffield (to date of census) - - - - | 2,313                              | 253     | 10·9      |
| Warrington - - - -                    | 427                                | 41      | 10·3      |
| Dewsbury - - - -                      | 510                                | 41      | 8·0       |
| London - - - -                        | 1,411                              | 99      | 7·0       |
| Leicester - - - -                     | 180                                | 4       | 2·2       |

212. The facts which we have quoted from the reports upon the epidemics in the six towns dealt with, certainly afford strong support to the view that vaccination exerts a powerful influence on the fatality of the disease. It is said that the division into the classes of vaccinated and unvaccinated cannot be relied on as accurate. It is quite possible that the classification may not be strictly accurate, though great pains appear to have been taken to make it so. Doubtful cases were in general included amongst the vaccinated class, and care was taken to see that none should be included in the unvaccinated class except those who properly came within it. Where the doubtful cases were separately stated in the reports we have added them to the vaccinated class for the purpose of our calculations. If all reasonable allowance be made for the possibility of error, it appears to us that the broad result would not be materially altered, and that the contrast between the fatality in the two classes would still be very remarkable.

213. It must be remembered that the argument to be derived from these statistics does not depend for its strength upon its being established that there was a strictly accurate discrimination between the vaccinated and unvaccinated. If those who contend that vaccination is altogether inefficacious be correct in their views, the fact that persons have been vaccinated can have no tendency to affect their liability either to be attacked or to die of the disease. Those, therefore, who are selected as being vaccinated persons might just as well be so many persons chosen at random out of the total number attacked. So far as any connexion with the incidence of, or mortality from, small-pox is concerned, the choice of persons might as well have been made according to the colour of the clothes they wore. How comes it, then, that those selected out of the mass merely because, on the hypothesis we are considering, they have been the subjects of a wholly ineffectual or even mischievous proceeding should suffer from attacks of small-pox so much less fatally than the mass from which they are drawn?

214. The figures are worth a closer examination. Taking the six towns together they are large. The unvaccinated attacked amounted to 2,321; of these 822 died, or 35·4 per cent. 1,449 of those attacked were under 10 years of age, of these 523 died, or 36·0 per cent. 870 were over 10 years of age, of whom 299 died, or 34·3 per cent. It is very noteworthy that amongst these persons selected because they were unvaccinated, or believed to be so, the fatality under 10 years of age was 36·0 per cent., over that age 34·3 per cent.; the correspondence between these figures is singularly close.



215. Let us turn now to the mass of cases from which these were selected. It consisted of 11,065 attacks resulting in 1,283 deaths, *i.e.*, a per-centage of 11·5. The cases selected from these as unvaccinated were, as we have seen, 2,321, or 20·9 per cent., of the total number, a large sample in fact drawn from the bulk. Deducting from the total numbers, the attacks and deaths of those said to be unvaccinated, the result is as follows:—2,321 attacks and 822 deaths, or 35·4 per cent. fatality, as we have seen in the class said to be unvaccinated, and 8,744 attacks with 461 deaths, or 5·2 per cent. fatality, in the rest of the population attacked by the disease. How is this to be accounted for?

216. If we direct our attention to the case of children under 10, the result is still more remarkable. The total number of this class attacked in the six towns was 2,038, of whom 539 died, or 26·4 per cent.; 1,449 of these are recorded as unvaccinated, of whom 523 died, or 36·0 per cent.; amongst the remaining 589 the number of deaths was sixteen only, or 2·7 per cent. In cases where the age exceeded 10 years, 9,001 were attacked, of whom 744 died, or 8·2 per cent.; of these, 870 are classed as unvaccinated, of whom 299, or 34·3 per cent., died; deducting these from the total number, the result shown is that of 8,131 attacked, who had been vaccinated, 445, or 5·4, died.

217. Upon the hypothesis, then, that vaccination has no relation to small-pox, and no tendency to mitigate the effect of the disease, we have before us an arbitrary selection which might just as well have been made by drawing lots of 20·9 per cent. of the total number of persons attacked; why should those thus selected display so remarkably different a proportion of fatal cases, a death-rate to attacks of 35·4 per cent. in the one class, and 5·2 per cent. in the other? What reason is there why there should be any substantial difference between the two classes? Or why should not the fatality have chanced to be higher even in the 8,744 cases of attack than in the 2,321? It may be said that children succumb more readily to any illness than adults, and that if there happened to be a larger proportion of children amongst those classed as unvaccinated than amongst the residue of the total number attacked, this would account for some disparity. Even conceding this, it cannot be said, in our opinion, to be an adequate explanation of so vast a difference.

Let us see, then, how the matter stands if child life, up to the age of 10 years, be separately regarded. According to the view we are testing, a selection was arbitrarily made, out of 2,038 cases of children attacked, of 1,449 who were, or were said to be, unvaccinated. Why should the fatality amongst these 1,449 have been 36·0 per cent., whilst amongst the 589, classed as vaccinated, it was 2·7 per cent. only? Why when the children attacked were arbitrarily divided into two classes, 1,449 being placed in the one class, and 589 in the other, should the fatality in the one class have been so enormously greater than in the other? It may be said, and there is some force in the point, that inasmuch as children under three months would almost all be found in the unvaccinated class, whilst the vaccinated would almost all exceed that age, this circumstance would of itself account for a greater fatality in the unvaccinated than in the vaccinated class. It is remarkable that at Warrington, whilst no vaccinated child under one year of age was attacked by small-pox, there were ten such attacks and eight deaths amongst the unvaccinated of that age, all these deaths occurring at the age of one month or under. Although this feature did not characterise the mortality of children under ten years of age in other towns, it will be well, in order to eliminate the suggested distinction between the two classes, to exclude from both classes all children under one year of age. Adopting this classification the result is as follows:—

#### CHILDREN of the Age 1–10.

| Vaccinated.               | Unvaccinated.                |
|---------------------------|------------------------------|
| Attacks, 570; deaths, 16. | Attacks, 1,235; deaths, 375. |
| Fatality, 2·8 per cent.   | Fatality, 30·3 per cent.     |

The contrast is the more striking when it is remembered that all the doubtful cases are included in the vaccinated class, though many of them had, in all probability, never been successfully vaccinated. The doubtful cases in London alone account for 6 out of the 16 deaths, and raise the fatality from 1·8 to 2·8 per cent.

Is the different fatality manifested in the two classes into which the children between the ages of one and ten years who were attacked by small-pox are thus divided



according as they were or were not vaccinated, a mere freak of chance? It is scarcely possible to believe that it can be so. When it is found that the same contrast is exhibited on comparing the fatality amongst the classes of vaccinated and unvaccinated in each of the six towns with which we have been dealing, and even in different districts of Sheffield and Dewsbury where a similar discrimination between the vaccinated and unvaccinated was made, and when it is borne in mind that both classes lived in the same towns, were of similar ages, and suffered in the same epidemics, it is impossible to believe that there was nothing to distinguish the two classes from one another.

218. The relation of the fatality of the vaccinated to that of the unvaccinated class is not precisely the same in each of the towns. One would not expect it to be so on any hypothesis, but in every case the fatality in the unvaccinated class was very large. The fatality in the unvaccinated class was smallest at Leicester, where, as we have already indicated, the fatality generally was less than in the other towns; even there the fatality in the unvaccinated class under 10 was 14 per cent., whilst there was not a single death amongst the vaccinated class of that age.

219. The conclusion, then, is surely irresistible that some circumstance must have existed distinguishing the class selected as vaccinated from that selected as unvaccinated, and which rendered it less liable to suffer fatally from small-pox. The only condition which regulated the distribution of the cases into the one class or the other was the presence or absence of vaccination. Whatever mistakes may have been made in erroneously including persons in the one class or the other, it cannot be doubted that the great majority of the one class were vaccinated, whilst the great majority of the other class were unvaccinated. Unless, then, some circumstance existed other than the presence or absence of vaccination, which distinguished the two classes and could account for the remarkably different small-pox fatality which characterised them, it would be only reasonable to attribute this difference to vaccination. We will consider presently the causes which have been suggested, other than vaccination, as an explanation of the phenomenon we have been considering.

220. The evidence afforded by the experience in these towns does not stand alone; the same phenomenon of a higher fatality amongst the unvaccinated than the vaccinated had been previously observed.

221. Mr. Marson's observations, made during 32 years in respect of 19,467 cases at the Small-pox Hospital, showed a fatality among the unvaccinated of 36·5 per cent., whilst the highest death-rate amongst those having vaccination marks, viz., those having one vaccination cicatrix only, was 12·8 per cent. We shall have to revert to his figures presently, when considering the question whether various degrees of vaccination differ in their protective effect.

*Other observations of the fatality of small-pox amongst vaccinated and unvaccinated.*

222. Dr. Gayton furnished us with the results of an examination of 10,403 cases at the Homerton Hospital between the years 1873 and 1884. The deaths amongst the vaccinated (in which class are included those said to be vaccinated, but who had no marks) were 869 out of 8,234, or 10·5 per cent.; the deaths amongst the unvaccinated 43·4 per cent., the numbers being 938 out of 2,169.

2, App., 243-5.

So far we have made no discrimination as regards the age of the persons attacked. Out of the total number of 1,807 deaths, 700, i.e., 38 per cent., were under 10 years of age. The fatality of the vaccinated under 10 was 10·4, being 137 out of 1,306. The deaths among the unvaccinated of a similar age were 563 out of 1,187, or a fatality of 47·3 per cent. If the cases of children under one year of age be excluded, the figures are as follows:—In the vaccinated class 1,286 cases with 130 deaths, or a fatality of 10·1 per cent.; in the unvaccinated class 1,032 cases with 465 deaths, or a fatality of 45 per cent.

Over the age of 10, the fatality of the vaccinated was 10·5, being 732 out of 6,928. The death-rate of the unvaccinated of a similar age was 38·1, being 375 out of 982.

223. Mr. Sweeting put before us statistics relating to 2,584 cases at Fulham Hospital between the years 1880 and 1885. Of these 428 died, or 16·5 per cent. The deaths among the vaccinated (in which class are included, as with Dr. Gayton's tables, those said to be vaccinated, but who bore no marks) were 263 out of 2,226, or 11·4 per cent. The deaths amongst the unvaccinated were 165 out of 358, or 46 per cent. Discriminating again with reference to the age of the persons attacked. Of 202 under 10 years of age in the vaccinated class, 16 died, or 7·9 per cent. Of 168 of a similar

Q. 3689.



age in the unvaccinated class, 78 died, or 45 per cent. The fatality of the vaccinated over 10 years of age was 12·2, being 247 out of 2,024. Of the unvaccinated of a similar age, 87 out of 190, or 45·7 per cent., died.

224. It has been urged against these statistics that, even though every effort were made to classify the cases correctly, the classification was still open to error, inasmuch as persons might be brought to the hospital with the eruption of confluent small-pox upon them, which would prevent the marks even of efficient vaccination being visible.

Q. 1,822-6;  
3,724-5,  
3,728-31.

It is true that this might be so in some cases, but both Dr. Gayton and Mr. Sweeting assert that it could have happened very rarely. We do not think that it could make such a difference as to modify substantially the contrast exhibited in the fatality amongst the vaccinated and unvaccinated classes.

225. Inasmuch as the vaccinated class includes, both in the case of Dr. Gayton's and Mr. Sweeting's tables, a considerable number who, though said to be vaccinated, showed no marks, it may be interesting to observe what was the fatality in that class when dealt with separately. It contained in all probability a certain proportion of unvaccinated persons. The fatality in this doubtful class in Dr. Gayton's table was 27·1 per cent., being 352 out of 1,295. Eliminating these cases from the total number hitherto treated as vaccinated the result shown is a fatality of 7·4 per cent., being 517 out of 6,939.

2, App., 243-5.

226. Dealing with Mr. Sweeting's statistics in the same manner, we find the fatality in the doubtful class to be 33 per cent., being 88 out of 266, whilst in the vaccinated class, eliminating these doubtful cases, it is 175 out of 1,960, or 8·9 per cent. It will thus be seen that there is a somewhat striking correspondence in the death-rate shown by this doubtful class in the two cases, and that in each case that death-rate was considerably higher than the fatality in the vaccinated, but considerably lower than that in the unvaccinated class.

Q. 3689.

227. The statistics to which we have been directing attention have been subjected to criticism on the ground that they show a much higher death-rate in proportion to attacks amongst the unvaccinated class than was shown by records of small-pox mortality prior to the introduction of vaccination. The objection is chiefly founded upon the statistics collected by Dr. Jurin. We have already pointed out (§ 53) that these statistics cannot be relied on as establishing a normal fatality of small-pox in the epoch preceding the introduction of vaccination, as there was a great difference in the fatality of the epidemics from which the statistics were compiled. It seems well established that the fatality of small-pox varies greatly in different epidemics. The statistics given in the preceding paragraphs in our Report will show that in the local epidemics, with which we have specially dealt, the fatality among the unvaccinated cases exhibited very considerable variations. At Sheffield it was as high as 49·6 per cent., in Warrington it was 35·2, in Dewsbury 25·1, in London 24·2, in Leicester 12·0, and in Gloucester 40·8 per cent. At all events, the fact, or alleged fact, on which the criticism is founded, cannot be regarded as a proof that the classification into vaccinated and unvaccinated has not been accurately carried out.

228. We have already called attention in dealing with the statistics of the six towns to the improbability that a selection, solely on the ground of the presence or absence of vaccination, should by mere chance show so remarkably different a fatality in the two classes. That argument is strengthened when we see the same results exhibited on a division into vaccinated and unvaccinated, of 10,403 cases in the Homerton Hospital, and 2,584 cases in the Fulham Hospital, and when we find, comparing the death-rate of the vaccinated in the two hospitals, that in the former it was 10·5 per cent. and in the latter 11·4 per cent., and that, making a similar comparison of the unvaccinated classes, in the former it was 45·4 per cent., in the latter 46 per cent.

229. We proceed to consider the explanations of the contrast between the fatality of small-pox in the case of the vaccinated and the unvaccinated which have been suggested by those who deny that it is due to vaccination. It has been said, and this is the main argument employed, that the unvaccinated are mostly to be found in the poorer and more neglected classes of the population, who would on that account be constitutionally weaker and less able to resist an attack of small-pox and to escape a fatal result. Speaking generally, this may be to some extent true, though it is not so at all times and in all places. There are facts stated in the reports we have so often quoted, especially those relating to Warrington, Dewsbury, Leicester, and Sheffield, and in the evidence with reference to the last-named town, which seem to show that the explanation



suggested cannot be the correct one. In the report on the Warrington epidemic, as we shall see immediately, it is expressly stated that the vaccinated and unvaccinated were of the same class and lived in the same houses and in the same manner. Moreover, the persons admitted into the Homerton and Fulham Hospitals were for the most part, whether vaccinated or unvaccinated, of the pauper class or of the class immediately above it. It is not conceivable that in this section of the population the presence of vaccination or its absence should indicate so marked a difference of constitutional strength as to account for the difference of small-pox fatality which we are now considering. It is further to be observed that, taking the statistics of the six towns, in the case of the vaccinated aged 1-10 the fatality was 2·8 per cent., in the case of the unvaccinated of a similar age it was 30·3 per cent., whereas in the case of those over 10 years the fatality in the case of the vaccinated was 5·4 per cent., in the case of the unvaccinated 34·3. It will be seen, therefore, that the disparity in the death-rate of those classed as vaccinated and unvaccinated was greater nearer the date of vaccination than it was at a later period. The same phenomenon is observable in the hospital statistics. We do not think it possible, then, to accept the suggestion that there were more of the poor in the unvaccinated than in the vaccinated class as a sufficient explanation of the contrast we have been considering. The difference of fatality in the two classes is, in our opinion, far too great to be thus accounted for, and the suggested explanation does not explain all the phenomena. We should think it much more reasonable to conclude that the remarkable difference of fatality was due to vaccination, even if it were only in that respect that the two classes differed in their relation to small-pox. But this is not the case. There are other points of distinction between the two classes. We are about to discuss the differences they exhibit both in the liability to be attacked by small-pox and in the type of the disease from which they suffer. And the bearing of these facts upon the question whether the smaller fatality in the vaccinated class is due to vaccination, which is obviously important, will afterwards be considered.

App. V.,  
p. 26.

230. Another explanation given of the greater fatality which characterises the unvaccinated class has been that, inasmuch as the unvaccinated class includes those whose vaccination has been postponed for medical reasons, there would be amongst its number a larger proportion of children of delicate constitution who would on that account be more likely to succumb to an illness. With reference to this argument, it is to be observed in the first place that the number of those whose vaccination is postponed for medical reasons is but small, and in the next place that the postponement by no means necessarily shows that the child is of a delicate constitution. It often results from the presence of some ailment to which young children are subject, and which affects the strong no less than the weak. But besides this it must be remembered that those whose vaccination is postponed are frequently vaccinated at a later period, and thus pass from the class of the unvaccinated to that of the vaccinated. Giving due weight to these considerations, we find it impossible to believe that the cause suggested can account to any material extent for the difference to which we have been adverting between the fatality among children under 10, observed in the classes of vaccinated and unvaccinated. It must always be borne in mind that the difference is not a narrow one, it is not measured by a small per-centage. A broad margin might be allowed for error without the force of the argument derived from the contrast being seriously diminished.

231. The next point for consideration is the question whether the evidence shows that vaccination has a protective effect against an attack of small-pox. We have lately been considering whether it affords any protection against death from the disease in persons attacked by it. The question with which we have now to deal obviously presents greater difficulty in arriving at accurate results. The liability to attack depends on contact with or proximity to sources of infection. When an epidemic of small-pox visits a town, the liability to infection of the inhabitants of different parts of the town may differ widely. Those who are residing in a house where a person is suffering from small-pox are subject to a risk which does not attach to persons living in a house not so invaded. On the other hand, persons moving about the town, or congregating for purposes of business or pleasure may come in contact with sources of contagion, so that the risk of contagion is, of course, not confined to those who are living in a house where small-pox is present, though it may be greater in the case of this class than of the rest of the community. These considerations appear to have been kept in view by the medical men who have dealt with the matter in their reports on the local epidemics to which we have so often referred.

*The attack-rate of small-pox amongst vaccinated and unvaccinated in the six epidemics.*



Q. 1961,  
1963.

232. The following results are derived from an analysis of the returns relating to the total population enumerated in the census taken at Sheffield, which we have already mentioned :—

Of 268,397 persons of all ages returned as vaccinated 4,151, or 1·55 per cent., had been attacked by small-pox.

Of 5,715 persons of all ages returned as unvaccinated 552, or 9·7 per cent., had been attacked by small-pox.

Of 68,236 vaccinated children under 10 years of age 353, or 0·5 per cent., had been attacked.

Of 2,259 unvaccinated children under 10 years of age 228, or 10·1 per cent., had been attacked.

Of 196,905 vaccinated persons aged 10 years and upwards 3,774, or 1·9 per cent., had been attacked.

Of 3,429 unvaccinated persons aged 10 years and upwards 322, or 9·4 per cent., had been attacked.

These results have been subjected to criticism on the ground that in the case of many of the persons classed as vaccinated the operation was performed in the course of the epidemic only ; that at its commencement, and it may be for a considerable time afterwards, they belonged to the unvaccinated class ; and that this transfer of them to the class of vaccinated persons renders the attack-rate amongst the unvaccinated, shown by the figures, higher than it really was. Dr. Barry furnished us with particulars of the number of these returned as vaccinated and unvaccinated in particular districts, from which it appeared that if the persons vaccinated during the progress of the epidemic were added to the unvaccinated class its numbers would be increased by about 28 per cent. In his opinion the proportion of persons vaccinated during the epidemic in the districts referred to was probably at least equal to the proportion passing from the unvaccinated to the vaccinated class in the town generally.

In order to meet the objection made we have thought it well to modify the figures by adding in all cases 28 per cent. to the numbers of the unvaccinated, and by deducting from the vaccinated the numbers added to the unvaccinated classes. The result of these changes will appear from the following figures :—

Of 266,797 vaccinated persons of all ages 4,151, or 1·55 per cent., were attacked by small-pox.

Of 7,315 unvaccinated persons of all ages 552, or 7·5 per cent., were attacked by small-pox.

Of 67,603 vaccinated children under 10 years of age 353, or 0·5 per cent., were attacked.

Of 2,892 unvaccinated children under 10 years of age 228, or 7·8 per cent., were attacked.

Of 195,945 vaccinated persons aged 10 years and upwards 3,774, or 1·9 per cent., were attacked.

Of 4,389 unvaccinated persons aged 10 years and upwards 322, or 7·3 per cent., were attacked.

It will be noticed that the contrast remains very striking, and that it would be scarcely less so even if a considerably larger transfer were made, from the vaccinated to the unvaccinated classes.

233. It is not necessary to give the figures, separately, for each of the nine districts, into which Sheffield is divided, but it may be stated that in each of them the same feature appears of a much higher rate of attack among the unvaccinated than among the vaccinated.

234. So far the comparison has been made between the classes of vaccinated and unvaccinated which together formed the entire enumerated population of the town without reference to any circumstance which might render any of them specially liable to attack. We turn now to the state of the case in the houses invaded by small-pox.

Of the 18,020 vaccinated persons of all ages enumerated as living in invaded houses 4,151, or 23·0 per cent., had been attacked.

Of the 736 unvaccinated persons of all ages enumerated as living in invaded houses 552, or 75·0 per cent., had been attacked.

Of 4,493 vaccinated children under 10 years of age 353, or 7·8 per cent., had been attacked.

Of 263 unvaccinated children under 10 years of age 228, or 86·9 per cent., had been attacked.

Q. 29,333-  
43.

Q. 1963-5.



Of 13,435 vaccinated persons aged 10 years and upwards 3,774, or 28.1 per cent., had been attacked.

Of 469 unvaccinated persons aged 10 years and upwards 322, or 68.6 per cent., had been attacked.

Treating these figures in the same way as we did those relating to the attack rate in the case of the population generally, by making a similar transfer from the vaccinated to the unvaccinated classes, we obtain the following results:—

Of the 17,814 vaccinated persons of all ages living in invaded houses 4,151, or 23.3 per cent. were attacked.

Of the 942 unvaccinated persons of all ages living in invaded houses 552, or 58.6 per cent. were attacked.

Of 4,419 vaccinated children under 10 years of age 353, or 7.9 per cent. were attacked.

Of 337 unvaccinated children under 10 years of age 228, or 67.6 per cent. were attacked.

Of 13,304 vaccinated persons aged 10 years and upwards 3,774, or 28.3 per cent. were attacked.

Of 600 unvaccinated persons aged 10 years and upwards 322, or 53.6 per cent. were attacked.

235. It will be seen that, as was to be expected, the proportion attacked in each class was much higher than when we were dealing with the total enumerated population, but the contrast between the attack-rate of the unvaccinated and vaccinated classes is not less remarkable. We may observe, too, that the same contrast is seen if the attack-rate in the invaded houses in each of the districts of Sheffield is separately examined.

236. We pass on to consider the information, bearing on the question with which we are dealing, afforded by the report on the Warrington epidemic. With reference to the inhabitants of houses invaded by small-pox during the epidemic at Warrington, Dr. Savill states that bearing in mind the social class affected with small-pox, it may be taken as nearly certain that all the inmates of an infected house were exposed in some degree to infection either before or after recognition of the disease, either from the patient, or from the same source as the patient. App. V.,  
p. 26.

The number of these infected houses was 457, but as regards 20 of them precise information could not be obtained as to inmates other than those who contracted small-pox. In the remaining 437 infected houses, there resided 2,535 persons, of whom 41 were stated to have had small-pox in previous years. Amongst the other 2,494 inmates, there were 2,387 persons who were classed as having been vaccinated at some time of their lives, before the house became infected. Of these 553, or 23 per cent., were attacked by small-pox. Included in this calculation there are 100 persons about whose vaccination Dr. Savill was unable to satisfy himself. On the information before him, some of them might or might not have been vaccinated. App. V.,  
pp. 22, 26  
and 27.

In the same houses were found 107 unvaccinated persons, and of these 60 or 56.0 per cent. were attacked.

237. Of the 2,535 people in these infected houses, 688 were of the ages 0–10. Of these 633 were vaccinated, and 55 unvaccinated. App. V.,  
p. 49

Of the 633 vaccinated children, 28 were attacked, or 4.4 per cent.

Of the 55 unvaccinated children, 30 were attacked, or 54.5 per cent.

Those over 10 years of age were 1,847 in number, of whom 560 were attacked. Excluding the 41 persons who were stated to have previously had small-pox (five of whom were again attacked), there remain 1,806 persons, of whom 555 were attacked. Of the 1,806, there were 1,754 vaccinated and 52 unvaccinated.

Of the 1,754 vaccinated persons over 10 years of age, 525 were attacked or 29.9 per cent.

Of the 52 unvaccinated persons over 10 years of age, 30 were attacked or 57.6 per cent.

238. With reference to the contrast between the attack rate in the case of the vaccinated and of the unvaccinated living in infected houses, Dr. Savill says: “I could ascertain no reason for this remarkable difference in the attack rate in the two classes, unless the fact of vaccination protected the vaccinated persons from being attacked by small-pox. Being members of the same families, they lived in the same houses (which, be it noted, were of a remarkably uniform type), ate the same food, often did the same work, and were exposed to the same hereditary and external influences.” App. V.,  
p. 26.



App. V.,  
pp. 24 and  
27.

239. Another comparison bearing on the same point is to be found in Dr. Savill's report. It relates to the population in a highly infected area which he calls "The 300 yards Akin Street area." This area contained a population of 3,394 persons (or 3,330, excluding those who were stated to have had small-pox in previous years), of whom 29 only were unvaccinated. Among the 3,301 persons forming the vaccinated class (including as elsewhere doubtful vaccination) there were 84 attacks, being 2·5 per cent., whilst in the unvaccinated class of the same population there were 6 attacks, being 20·6 per cent.

App. III.,  
pp. 2 and  
124.

240. We turn now, with reference to the same point, to a consideration of Dr. Coupland's report on the Dewsbury epidemic. In the course of the outbreak 648 houses were invaded, but Dr. Coupland was only able to obtain information on this point as regards 544 of them. In these 544 infected houses, which contained 3,000 inhabitants, there were 2,315 \* vaccinated persons, including cases of alleged vaccination. Of these 568 were attacked, the rate being 24·5 per cent.

Of unvaccinated persons in these infected houses there were 605, including as before persons described as "under vaccination." Of these 315 were attacked, or 52·0 per cent.

241. Discriminating according to ages:—

Of vaccinated persons under 10 years of age there were 408, of whom 42 were attacked, or 10·2 per cent.

Of unvaccinated persons under 10 there were 311, of whom 158 were attacked, or 50·8 per cent.

Of vaccinated persons over 10 years of age there were 1,896, of whom 526 were attacked, or 27·7 per cent.

Of unvaccinated persons over 10 years of age there were 294, of whom 157 were attacked or 53·4 per cent.

App. VI.,  
46 and 62.

242. In his investigation of the Leicester epidemic, Dr. Coupland scrutinised in the same manner the relation which the attacks of the vaccinated bore to those of the unvaccinated.

Of 1,229 persons in invaded houses (320 of whom were attacked with small-pox) 841 † were vaccinated, of whom 170 were attacked, a rate of 20·2 per cent., whereas 388 were unvaccinated, of whom 150 were attacked, a rate of 38·6 per cent.

Of vaccinated persons under the age of 10 years there were 78, of whom 2 were attacked, a rate of 2·5 per cent.

Of the unvaccinated under the age of 10 there were 283, of whom 100 were attacked, a rate of 35·3 per cent.

Of those over 10 years of age, 754 were vaccinated, of whom 168 were attacked, or 22·2 per cent.; 105 were unvaccinated, of whom 50 were attacked, or 47·6 per cent.

The figures given require to be slightly modified if those who were stated to have had small-pox prior to the outbreak be eliminated; there were in all 19 such persons, none of whom suffered from small-pox on this occasion. Twelve of them were vaccinated, and five unvaccinated, and as to the vaccinal condition of the other two there is no information. Eliminating these cases, the rate among the vaccinated over ten would be raised to 22·6 per cent., and amongst the unvaccinated to 50 per cent. As they were all individuals above the age of 30 years, the attack rates in the age period 0 to 10 would not be altered.

App. VII.

243. In the case of the epidemic at Gloucester, Dr. Coupland was only able to obtain information, with reference to this point, as to 899 out of a total of 1,097 invaded houses. There is, however, no reason to believe that the conditions were materially different as regards the other 198 houses invaded by small-pox.

In the 899 houses there resided 4,861 persons. Of these 3,386 had been vaccinated at some time in their lives before their house became infected, including all those in whose case there was any doubt as to whether or not they had been vaccinated. The remaining 1,475 were unvaccinated at the time their house became infected, though a considerable proportion of them (those described as "under vaccination") were subsequently vaccinated.

Of the 3,386 persons forming the vaccinated class, 1,028, or 30·3 per cent., were attacked. Of the 1,475 persons forming the unvaccinated class, 689, or 46·7 per cent., were attacked.

244. In the vaccinated class there were 272 children under 10 years of age, of whom 24, or 8·8 per cent., were attacked.

\* Note.—The age of eleven of these 2,315 vaccinated persons was not ascertained.

† Note.—The age of nine of these 841 vaccinated persons was not ascertained.



In the unvaccinated class there were 1,331 children under 10, of whom 617, or 46·3 per cent., were attacked.

In the vaccinated class there were 3,114 persons over 10 years of age, of whom 1,004, or 32·2 per cent., were attacked.

In the unvaccinated class there were 144 persons over 10, of whom 72, or 50 per cent., were attacked.

245. In the reports on the Sheffield, Dewsbury, and Leicester epidemics other data are given for the purpose of enabling a comparison to be made of the attack-rate in the classes of vaccinated and unvaccinated persons. It is not necessary to state here the details to be found in the reports, it is sufficient to say that they all indicate an attack-rate amongst the unvaccinated markedly in excess of that found in the class of vaccinated persons.

246. It is worth special notice that in all these cases the contrast between the attack-rate of the classes of vaccinated and unvaccinated respectively is much more striking in the case of children under 10 years of age than in the case of those over that age.

This will be seen by a glance at the following table:—

|                      | Attack Rate under 10. |               | Attack Rate over 10. |               |
|----------------------|-----------------------|---------------|----------------------|---------------|
|                      | Vaccinated.           | Unvaccinated. | Vaccinated.          | Unvaccinated. |
| Sheffield - - - - -  | 7·9                   | 67·6          | 28·3                 | 53·6          |
| Warrington - - - - - | 4·4                   | 54·5          | 29·9                 | 57·6          |
| Dewsbury - - - - -   | 10·2                  | 50·8          | 27·7                 | 53·4          |
| Leicester - - - - -  | 2·5                   | 35·3          | 22·2                 | 47·6          |
| Gloucester - - - - - | 8·8                   | 46·3          | 32·2                 | 50·0          |

247. In his report upon the outbreaks in London during 1892 and 1893 Dr. Luff has not entered into the question of the rate of attack among the unvaccinated as compared with the vaccinated. His report, nevertheless, affords some data for such a comparison. Of a total number of 2,353 cases as to which he obtained information there were 409 unvaccinated persons, or 17·3 per cent. It is not likely that the per-centage of unvaccinated persons, whether in London or in the districts specially affected, was as great as this.

Dealing with the age period 0–10, there were 358 attacks.

Of the persons thus attacked, 228 were unvaccinated, or a per-centage of 63·7.

It is not open to doubt that this was greatly in excess of the per-centage of unvaccinated persons under 10 years of age in London or in any part of it.

248. Turning now to the statistics of small-pox in London hospitals supplied by Dr. Gayton and Mr. Sweeting, we find that the per-centage of unvaccinated persons treated in the Homerton Hospital was 20·8; the numbers being 2,169, out of 10,403. Of children under 10 years of age the number of unvaccinated admitted was 1,187, out of 2,493, or 47·6 per cent.

At the Fulham Hospital 358 was the number of admissions of unvaccinated persons, out of a total of 2,584, the per-centage being 13·8.

Out of the total number of 370 children under 10 years of age admitted to the hospital 168, or 45·4 per cent., were unvaccinated. It will be remembered that all those who were said to be vaccinated, even though they showed no marks of it, were excluded from the unvaccinated class.

When these figures are examined they show a proportion of unvaccinated persons, especially children, admitted to the hospital which it is impossible to believe corresponded with the proportion of unvaccinated persons existing in the population of London or of any district of it.

249. It has been suggested that the inmates of these hospitals were drawn from the poorer class of the population, and that in that class there would be a larger proportion of unvaccinated persons than in the population at large. This, probably, is so to some extent. But it seems to us quite inadequate as an explanation of the very large proportion of unvaccinated children admitted to the hospitals. When the returns of vaccination in London are examined it will be seen that the children not finally accounted for between the years 1872 to 1884 had only ranged from 9·3 of the births in 1874 to 5·7 in 1881, the average for those 13½ years being but 7·4.

App. IV.,  
pp. 2, 5, 12  
and 15.

*Other facts  
as to the  
attack-rate  
of small-pox  
amongst  
vaccinated  
and un-  
vaccinated.*



250. Our attention has been called to the fact that the proportion of vaccinated patients admitted to the Highgate Small-pox Hospital has often been as high as 94 or 95 per cent. And it has been suggested that this indicates an attack-rate in London in the class of vaccinated persons quite as high as that prevailing in the case of the unvaccinated. The experience at the Highgate Hospital certainly differs greatly from that of either Homerton or Fulham. The test was a larger one in point of number at the two latter hospitals than at the former. Moreover, the fact mentioned in the preceding paragraph must be borne in mind. In London the absence of vaccination is to be found chiefly in the poorer classes of the population. The inmates of the Highgate Hospital belonged in part to a more prosperous class. In that class the cases of non-vaccination would be very rare. Moreover, those who were admitted by contract with the Guardians of different Unions came from areas outside London. It will not do, therefore, to estimate what was the proportion of vaccinated and unvaccinated persons in the population of London when considering whether the unvaccinated contributed more than their share of the inmates of the Highgate Hospital.

251. We think, taking it all together, that the evidence bearing upon the question whether the vaccinated are less liable to be attacked by small-pox than the unvaccinated, points to two conclusions; first, that there is, taking all ages together, less liability to attack among the vaccinated than among the unvaccinated, and next, that the advantage in this respect enjoyed by vaccinated children under 10 years of age is greatly in excess of that enjoyed at a more advanced period of life.

We have been able to add the experience derived from the recent epidemic in Gloucester to that of the other five towns so far as regards the age incidence, fatality, and attack-rate of the disease. The combination of the Gloucester cases with those derived from other towns increases the total by more than 20 per cent. It is a striking fact that the addition of these cases, though it has necessitated some small changes in the per-centages to which attention is called, has not rendered necessary any other alteration of the paragraphs, which were already in type when we received the Gloucester figures. All the contrasts which presented themselves when the combined figures of the other five towns were considered, are just as striking when the Gloucester figures are added.

It has not been possible for us to deal with the facts disclosed by the Gloucester epidemic in other respects than those alluded to, without delaying the presentation of our Report, which appeared to us undesirable.

252. It is alleged that vaccination not only diminishes the risk of attack by small-pox and the fatality of that disease, but that it renders the type of the disease in the vaccinated less severe than it would have been had they remained unvaccinated.

Small-pox differs greatly in the degree of its severity. It may be an illness of a very serious character, entailing grave after consequences, or it may be a comparatively trifling ailment. The most severe forms of the disease have been termed malignant or hæmorrhagic. Next in severity comes the confluent type, which is also of a very serious character. The mildest species of the disease has been termed varioloid, or sometimes simply "mild." Between the confluent and the mild or varioloid come in order of severity the coherent and the discrete types.

Quite apart from the danger of a fatal termination to the illness, it is obviously a matter of great importance to those who suffer from the disease that its type should in their case be of a mild rather than of a severe character, not merely because the illness is in the one case trifling and in the other painful and prolonged, but because evil consequences such as pitting of the countenance often follows in the one case which in the other are absent. It is important, then, to test the validity of the assertion that vaccination has this beneficent influence, and that for two reasons. If it can be established it would show, first, that vaccination carries with it this distinct advantage independently of the others we have been considering; and next, it would add support to the view that vaccination has an influence upon the disease of small-pox, a point which has been contested. Let us inquire, then, what light the evidence throws upon the claims thus advanced in favour of vaccination.

253. Commencing with Sheffield:—Of 825 vaccinated persons in the Borough Hospital in Winter Street during the 1887-88 epidemic:—

|      |         |           |                                   |
|------|---------|-----------|-----------------------------------|
| 293, | or 35·5 | per cent. | suffered from the varioloid type, |
| 413  | „       | 50·0      | „ „ discrete type,                |
| 107  | „       | 13·0      | „ „ coherent type, and            |
| 12   | „       | 1·5       | „ „ confluent type.               |

*The severity of type of small-pox amongst vaccinated and unvaccinated in five of the six epidemics.*



Of 280 unvaccinated persons in the same hospital—

None had the varioloid type.

50, or 17·9 per cent. suffered from the discrete type,

175 „ 62·5 „ „ coherent type, and

55 „ 19·6 „ „ confluent type.

Dealing now with those under 10 years of age:—

Of 27 vaccinated children—

22, or 81·5 per cent. had the varioloid type.

5 „ 18·5 „ „ discrete type.

Of 67 unvaccinated children—

None had the varioloid type.

13, or 19·4 per cent. had the discrete type.

50 „ 74·6 „ „ coherent type.

4 „ 6·0 „ „ confluent type.

254. It will be observed that in the case of the vaccinated children the disease was in all cases of one or other of the milder forms, varioloid or discrete, the great majority of them being of the mildest form, viz., varioloid. In the case of the unvaccinated, on the other hand, the great majority of the cases were of the severer forms, viz., coherent and confluent, and not one was of the mildest form, varioloid.

255. The type of the disease was examined in the same way in the other Sheffield hospitals. The numbers were, however, much less than in the Winter Street Hospital, and too small in each hospital to make a per-centage of each type of the disease of value. The varioloid and the discrete on the one hand, and the coherent and confluent on the other, were therefore classed together.

256. There were in these other hospitals a few cases of vaccinated children whose disease fell within the confluent and coherent class. It may be well, therefore, to state the result if the whole of the cases in the Sheffield hospitals are taken together. Q. 2019.

There were 1,298 vaccinated persons, with regard to whose cases the type of disease was recorded. Of these 1,075, or 82·8 per cent., suffered either from the varioloid or discrete type, and 223, or 17·2 per cent., from the coherent or confluent type.

The number of unvaccinated patients in the hospitals, with regard to whose cases the type of disease was recorded, was 443; of these, 82, or 18·5 per cent., suffered from either the varioloid or discrete type, and 361, or 81·5 per cent., from the confluent or coherent type.

257. It will thus be seen that the relation which the severe and milder forms of the disease bore to one another in the two classes was almost exactly reversed. The proportion of the severer type in the case of the unvaccinated was nearly the same as the proportion of the milder type in the case of the vaccinated.

No mention is made of hæmorrhagic cases; if there were any such, they were, no doubt, included under the class “confluent.”

258. Dealing next with the Dewsbury Report, Dr. Coupland classed the cases he investigated under the headings “confluent,” “coherent,” “discrete,” and “mild.” App. III., pp. 134-7. In 273 cases placed under the heading confluent, three were included which were also hæmorrhagic. Dr. Coupland ascertained the per-centage of attacks of the different types, according as they occurred among the vaccinated, the unvaccinated, those alleged to be vaccinated, and those who were undergoing vaccination. It may, perhaps, be thought a fairer test with respect to the point under consideration if, as before, we class those alleged to have been vaccinated with the vaccinated, and those undergoing vaccination with the unvaccinated, though the numbers of those alleged to be vaccinated and of those undergoing vaccination are small, and it does not make a substantial difference. Treating the case in this fashion, those vaccinated or alleged to have been vaccinated (whom we shall hereafter call the vaccinated) amounted to 644. The unvaccinated and those described as undergoing vaccination (whom we shall hereafter term the unvaccinated) were 364 in number.

Of the vaccinated there suffered—

From the confluent type 53, or 8·2 per cent.

„ coherent „ 63 „ 9·8 „

„ discrete „ 268 „ 41·6 „

„ mild „ 260 „ 40·4 „



Of the unvaccinated there suffered—

From the confluent type 219, or 60·2 per cent.

|   |          |   |    |   |      |   |
|---|----------|---|----|---|------|---|
| „ | coherent | „ | 61 | „ | 16·8 | „ |
| „ | discrete | „ | 63 | „ | 17·3 | „ |
| „ | mild     | „ | 21 | „ | 5·8  | „ |

259. Dealing separately, now, with the case of children of the age 0-10. Of the 45 vaccinated cases—

|                      |                 |
|----------------------|-----------------|
| 2, or 4·4 per cent., | were confluent. |
| 0                    | „ coherent.     |
| 9 „ 20·0 „           | „ discrete.     |
| 34 „ 75·6 „          | „ mild.         |

There was only one case of either the confluent or coherent type among the class undoubtedly vaccinated, the other confluent case was among those alleged to have been vaccinated.

Of the 171 unvaccinated cases—

|                        |                 |
|------------------------|-----------------|
| 94, or 55·0 per cent., | were confluent. |
| 26 „ 15·2 „            | „ coherent.     |
| 35 „ 20·5 „            | „ discrete.     |
| 16 „ 9·4 „             | „ mild.         |

App. VI.,  
pp. 45-6.

260. Reviewing next the information on the same point afforded by Dr. Coupland's report on the Leicester epidemic, and including as before the cases described as under vaccination among the unvaccinated, and the cases described as doubtful vaccination among the vaccinated, we find the following results:—

Of the 199 vaccinated cases—

|                       |                 |
|-----------------------|-----------------|
| 17, or 8·5 per cent., | were confluent. |
| 20 „ 10·1 „           | „ coherent.     |
| 50 „ 25·1 „           | „ discrete.     |
| 112 „ 56·3 „          | „ mild.         |

Of the 158 unvaccinated cases—

|                        |                                       |
|------------------------|---------------------------------------|
| 79, or 50·0 per cent., | were confluent (including malignant). |
| 36 „ 22·8 „            | „ coherent.                           |
| 28 „ 17·7 „            | „ discrete.                           |
| 15 „ 9·5 „             | „ mild.                               |

261. Dealing again separately with children aged 0-10, there were only two vaccinated children attacked, and both suffered from the mild type of the disease.

Of the 107 unvaccinated cases—

|                        |                                           |
|------------------------|-------------------------------------------|
| 54, or 50·5 per cent., | were confluent (including the malignant). |
| 23 „ 21·5 „            | „ coherent.                               |
| 20 „ 18·7 „            | „ discrete.                               |
| 10 „ 9·3 „             | „ mild.                                   |

App. IV.,  
pp. 2-5 and  
12-15.

262. From Dr. Luff's report on the outbreaks in London we obtain the following information. His classification is somewhat different; he divides the cases into "very mild," "discrete," "severe discrete," "confluent," and "hæmorrhagic." The cases in the latter class are very few in number, and it will be more convenient to class them with the confluent cases.

The number of cases in which the type of disease was discriminated was 2,353, of whom 1,944 were vaccinated or doubtful and 409 unvaccinated.

Of the 1,944 vaccinated cases—

|                        |                    |
|------------------------|--------------------|
| 108, or 5·6 per cent., | were very mild.    |
| 1,622 „ 83·4 „         | „ discrete.        |
| 32 „ 1·6 „             | „ severe discrete. |
| 182 „ 9·4 „            | „ confluent.       |

Of the 409 unvaccinated cases—

|                      |                    |
|----------------------|--------------------|
| 2, or 0·5 per cent., | were very mild.    |
| 142 „ 34·7 „         | „ discrete.        |
| 64 „ 15·6 „          | „ severe discrete. |
| 201 „ 49·1 „         | „ confluent.       |



## 263. Separating now children under 10 years of age :---

Of the 130 vaccinated cases—

30, or 23.1 per cent., were very mild.  
 83 „ 63.8 „ „ discrete.  
 4 „ 3.1 „ „ severe discrete.  
 13 „ 10.0 „ „ confluent.

Of the 228 unvaccinated cases—

1, or 0.4 per cent., was very mild.  
 84 „ 36.8 „ „ were discrete.  
 45 „ 19.7 „ „ severe discrete.  
 98 „ 43.0 „ „ confluent.

264. In Warrington, Dr. Savill reports on the type of disease in 661 cases, of which 593 were vaccinated or doubtful; 68 unvaccinated cases. He includes amongst the confluent cases those which were malignant or hæmorrhagic. App. V., pp. 51 and 43.

Of the 593 vaccinated cases—

323, or 54.5 per cent., were mild.  
 141 „ 23.8 „ „ discrete.  
 129 „ 21.8 „ „ confluent.

Of the 68 unvaccinated cases—

3, or 4.4 per cent., were mild.  
 17 „ 25.0 „ „ discrete.  
 48 „ 70.6 „ „ confluent.

265. Separating the cases of children aged 0-10, 33 of them were vaccinated and 32 unvaccinated.

Of the 33 vaccinated cases—

24, or 72.7 per cent., were mild.  
 7 „ 21.2 „ „ discrete.  
 2 „ 6.1 „ „ confluent.

Of the 32 unvaccinated—

2, or 6.2 per cent., were mild.  
 7 „ 21.9 „ „ discrete.  
 23 „ 71.9 „ „ confluent.

266. A somewhat closer examination of the distribution of the different types of disease is of importance.

Although the per-centages are not identical in the different towns there is a noteworthy correspondence in them, as will be seen from the following table. We have divided the cases into two classes. The one comprising the milder types—varioid, or mild and discrete; the other the more severe forms—coherent and confluent.

| —          |   |              |   | Milder. | Severer. |
|------------|---|--------------|---|---------|----------|
| Sheffield  | { | Vaccinated   | - | 82.8    | 17.2     |
|            |   | Unvaccinated | - | 18.5    | 81.5     |
| Dewsbury   | { | Vaccinated   | - | 82.0    | 18.0     |
|            |   | Unvaccinated | - | 23.1    | 76.9     |
| Leicester  | { | Vaccinated   | - | 81.4    | 18.6     |
|            |   | Unvaccinated | - | 27.2    | 72.8     |
| Warrington | { | Vaccinated   | - | 78.2    | 21.8     |
|            |   | Unvaccinated | - | 29.4    | 70.6     |

It will be seen that in the case of the vaccinated the proportion of milder cases is very similar. It ranges only from 7.82 per cent. at Warrington to 82.8 per cent. at Sheffield, and the figures relating to Sheffield, Dewsbury, and Leicester are remarkably alike, viz., 82.8, 82.0, and 81.4 per cent. The variations in the per-centages showing the proportion of milder to severer cases in the unvaccinated class are somewhat greater, though even these are comparatively unimportant. They range from 29.4 per cent. at Warrington to 18.5 per cent. at Sheffield.



267. In London a different classification of the types of disease renders comparison less easy. If, however, the severer class be composed of the severe discrete and the confluent, the milder class as before consisting of the mild and discrete, the result is as follows :—

| —      |   |              |   | Milder. | Severer. |
|--------|---|--------------|---|---------|----------|
| London | { | Vaccinated   | - | 89·0    | 11·0     |
|        | { | Unvaccinated | - | 35·2    | 64·8     |

268. If the proportion which the mild bear to the severe cases in those under ten years of age be examined, it will be seen that in the vaccinated class the ratio of the milder type is much greater than at all ages, indeed, the proportion of severer cases is in all the towns quite insignificant.

269. Before passing to another branch of the subject it will be well to take account of the bearing upon one another of the facts relating to the fatality, the attack-rate, and the type of the disease of small-pox, which we have been considering. Between the facts with which we have been concerned when investigating the fatality of small-pox and those which have engaged our attention when considering the type of the disease, the connexion is obvious and intimate.

In each of these cases we have had to deal with the same classes of vaccinated and unvaccinated persons—indeed, we may say with the very same persons—we have already pointed out that it is more than improbable that on a division of the persons who suffered from small-pox, into two such classes the fatality should be so strangely different unless there were something in the condition of the one class which differentiated it from the other and rendered those within it less liable to suffer fatally from the disease. What is to be said when it is found that apart from the fatality of the disease, its type in the two classes also differs, and perhaps even more widely, than its fatality does, and that the milder type distinguishes the same class which exhibits the smaller fatality? That this should be a mere chance coincidence is incredible when it is observed that the phenomenon is uniform not only in the case of epidemics in five different towns, but in the case of the same epidemic in different parts of the same town. The facts surely afford strong corroboration of two propositions: first, that a classification was on the whole accurately made in these cases of persons whose condition in relation to small-pox differed from one another; and, secondly, that this difference of condition was due to vaccination.

270. We have been concerned with the same elements only when investigating the fatality and type of the disease. We have had but to view the same sufferers under different aspects, ascertaining in the first place what was the death-rate in the two classes, and in the next place from what type of disease they suffered. When we came to deal with the attack-rate it was necessary to introduce a new element. Those living in the same houses and who, as far as could be judged, were, from their locality and surroundings, equally liable to be attacked, had to be divided into vaccinated and unvaccinated in order that the attack-rate in these two classes might be ascertained. If strong ground has been given for believing that the discrimination, among the persons attacked, according as they were or were not vaccinated has been successfully accomplished, it is the more likely that the separation of those liable to be attacked into the classes of vaccinated and unvaccinated has also been made with substantial accuracy. At all events the same difficulty has to be encountered by those who maintain that vaccination is without any influence upon small-pox, which we have already indicated when dealing with the question of the fatality amongst the vaccinated and unvaccinated. How does it happen that when a division has, on their hypothesis, been arbitrarily made into two classes, the condition which guided the discrimination not being such as to render the one less subject to attack than the other, it is nevertheless found that with a singular uniformity the rate of attack in the one class is much less than that witnessed in the other? But this is not all; we have to ask, further, how it happens that, whether fatality, attack-rate, or type be regarded, the difference between the two classes is much more marked in the case of children under 10 years of age who are nearer the period of vaccination than it is in the case of persons of more advanced years? To these questions those who deny that there is



any efficacy in vaccination have furnished no satisfactory answers. If, on the other hand, it be conceded that there is virtue in vaccination, and that it renders the vaccinated less liable to be attacked, or to suffer severely from, or to die of, the disease than the unvaccinated, the phenomena are all explained and the difficulty vanishes.

271. We cannot but lay stress on the force of the facts relating to the fatality, the attack-rate, and the type of the disease, in the vaccinated and unvaccinated classes, when considered in combination with one another. So far as can be ascertained there was nothing materially to distinguish the two classes, except that the one contained, with some possible exceptions, unvaccinated persons only, whilst the other consisted certainly for the most part of vaccinated persons, unless it be, as suggested, that the unvaccinated class comprised a larger proportion of weakly persons. We have already expressed our opinion that this suggested distinction is not an adequate explanation of the very different fatality in the two classes if that phenomenon stood alone. It appears to us in no way to account for the difference in the attack-rate and type of the disease which equally distinguish these same classes. Though a stronger constitution may enable a patient better to battle against the disease, and so avoid a fatal result, than a weaker one, we are not aware of any evidence that strength of constitution would determine the type of the disease. We believe that confluent cases are frequently found in those whose constitution is strong and mild cases in those who are not of robust health. Nor again, is there any ground for asserting that if both came equally within the reach of contagion a person of good physique would escape its influence while another less robust would be attacked by the disease. And yet the distinction between the vaccinated and unvaccinated is as marked or even more marked when the attack-rate and type of disease are studied than when the fatality of the disease is in question.

272. In dealing with the comparison between the attack-rate and fatality of the classes of vaccinated and unvaccinated persons, no distinction has hitherto been drawn in respect of the quality or character of the vaccination. Many (though not a large number proportionately) have been included in the vaccinated classes whose arms bore no marks of vaccination. In the case of some of these the operation of vaccination may have been performed without success. If vaccinia did not result from the operation, it could of course have no more effect than if it had never been performed. Amongst those whose bodies showed by the marks they bore that vaccination had undoubtedly been successful, the number of cicatrices varied from one to four and upwards. The cicatrices differed also in size. They have also been distinguished according as they exhibited, or did not exhibit, foveation. The question whether the protection afforded by vaccination differs in proportion as it has been more or less thorough has been made the subject of investigation.

*The fatality and severity of type of small-pox amongst vaccinated persons with marks of different quality.*

273. Beginning again with Dr. Barry's report, we find the following facts recorded with reference to the vaccinated persons who were treated in the Borough Hospital in Winter Street, Sheffield, from the commencement of the 1887 epidemic up to 31st March 1888. These numbered in all 825, excluding 39 cases in which the records with respect to the character of the vaccination and the type of disease were incomplete.

*Report on an epidemic of small-pox at Sheffield during 1887-88, pages 212-3.*

95 of these had no visible primary cicatrix, or 1 cicatrix only. Out of this number 13 died, or 13·7 per cent.

259 had 2 primary cicatrices, of whom 24, or 9·3, died.

372 had 3 primary cicatrices, of whom 21, or 5·7, died.

99 had 4 or more primary cicatrices, of whom 2, or 2·0 per cent., died.

Dr. Barry also discriminated the cases with reference to the type of small-pox.

In the class with either no visible primary cicatrix or 1 cicatrix only, the type of small-pox was varioloid in 19, or 20 per cent.; discrete in 47, or 50 per cent.; coherent in 25, or 26 per cent.; and confluent in 4, or 4·2 per cent.

In the class with 2 primary cicatrices, the type was varioloid in 73, or 28 per cent.; discrete in 132, or 51 per cent.; coherent in 50, or 19 per cent.; and confluent in 4, or 1·5 per cent.

In the class with 3 primary cicatrices, the type was varioloid in 149, or 40 per cent.; discrete in 193, or 52 per cent.; coherent in 27, or 7 per cent.; and confluent in 3, or 0·8 per cent.

In the class with 4 or more primary cicatrices, the type was varioloid in 52, or 52 per cent.; discrete in 41, or 41 per cent.; coherent in 5, or 5 per cent.; and confluent in 1, or 1 per cent.



It will be seen that there is a progressive diminution in the fatality, and also in the severity of the attack, in direct ratio to the increase in the number of primary vaccination cicatrices.

274. Dealing separately with those under 10 years of age, we find that:

With no visible primary cicatrices,

or 1 cicatrix only, there were 4 cases:—

2 „ varioloid.

2 „ discrete.

With 3 primary cicatrices:—

8 cases, 6 varioloid.

2 discrete.

With 2 primary cicatrices:—

8 cases, all varioloid.

With 4 or more primary cicatrices:—

7 cases, 6 varioloid.

1 discrete.

275. Although the figures with regard to the cases treated in the other Sheffield hospitals during the epidemic are too small, when classified, for the results to be of themselves of much value, they show a general correspondence with the results at the Winter Street Hospital stated in the preceding paragraph.

276. In relation to the Dewsbury epidemic, Dr. Coupland obtained particulars of the number and character of the marks produced by primary vaccination, in 480 instances, amongst the 627 vaccinated persons who contracted small-pox, but these particulars did not in all instances refer to each of the several points concerned. Thus the number of scars is recorded in 461 instances, the character as to foveation is recorded in 416, whilst the total area of the scars is only recorded in 290 cases.

Of the 461 persons whose marks were recorded there were:—

With 4 or more marks 42, of whom 1 died, or 2·3 per cent.

„ 3 marks 210, of whom none died.

„ 2 „ 175, „ 10 died, or 5·7 per cent.

„ 1 „ 34, „ none died.

It may be of importance to note that as regards age, the fatal case amongst those having four or more marks was in the age class 30–40, whilst the 10 fatal cases with two marks were distributed thus:—

|               |   |   |   |   |   |
|---------------|---|---|---|---|---|
| 5 to 10 years | - | - | - | - | 1 |
| 15 „ 20 „     | - | - | - | - | 1 |
| 20 „ 30 „     | - | - | - | - | 3 |
| 30 „ 40 „     | - | - | - | - | 3 |
| 50 „ 60 „     | - | - | - | - | 2 |

277. Dr. Coupland remarks that there is abundant scope for variation in the degree of foveation in vaccination marks. For the purpose of analysis he groups the cases into series according as all the marks are (a) plain and well foveated; (b) some foveated, others not, or in which the foveation and outline of the scar are indistinct; (c) those marks which present no foveation, but either a smooth surface, and perhaps a faint appearance, or else composed of more or less radiate cicatricial tissue, causing a mark of great prominence and irregular outline.

278. Of the 416 cases, of which the records are given, he places 294 in the first group, 32 in the second, and 90 in the third, remarking, however, that the classification is an arbitrary one, and that too much stress cannot be laid on the conclusions drawn from an analysis based upon it. The result shown is as follows:—

Having foveate marks 294, of whom 4 died, or 1·3 per cent.

Having partly or faintly foveate marks 32, of whom none died.

Having smooth, faint, or thick scars 90, of whom 2 died, or 2·2 per cent.

279. In dealing with the area of scars, Dr. Coupland adopted the classification of the vaccination scars according to their areas, employed in the statistical tables of the Metropolitan Asylums Board. The groups he formed were three in number, viz., class A<sup>1</sup> having marks the total area of which measured  $\frac{1}{2}$  or more of a square inch; class A<sup>2</sup> in which the total area of marks was  $\frac{1}{3}$  but less than  $\frac{1}{2}$  of a square inch; and class A<sup>3</sup> in which the total area was less than  $\frac{1}{3}$  of a square inch. The area was obtained in 290 cases.

246 fall into Class A<sup>1</sup> with 3 deaths, fatality 1·2 per cent.

27 „ „ „ A<sup>2</sup> „ 1 „ „ 3·7 „

17 „ „ „ A<sup>3</sup> „ 1 „ „ 5·8 „



280. From Dr. Coupland's report on the Leicester epidemic we obtain the following particulars:— App. VI., page 46.

In the vaccinated class, which consisted of 198 cases, the number of primary vaccination cicatrices was recorded in 182 of them, viz., 6 with 1 cicatrix, 42 with 2 cicatrices, 64 with 3 cicatrices, and 70 with 4 or more cicatrices.

The following tables show the distribution of the types of small-pox in relation to the number of cicatrices:—

Having one primary cicatrix:—

|           |   |   |   |   |   |   |                |
|-----------|---|---|---|---|---|---|----------------|
| Confluent | - | - | - | 1 | - | - | 16.6 per cent. |
| Coherent  | - | - | - | 1 | - | - | 16.6 "         |
| Discrete  | - | - | - | 1 | - | - | 16.6 "         |
| Mild      | - | - | - | 3 | - | - | 50.0 "         |

Grouping the severer and milder forms we have:—

Confluent and coherent, 33.2 per cent.

Discrete and mild, 66.6 per cent.

Having two primary cicatrices:—

|           |   |   |   |    |   |   |                |
|-----------|---|---|---|----|---|---|----------------|
| Confluent | - | - | - | 8  | - | - | 19.0 per cent. |
| Coherent  | - | - | - | 3  | - | - | 7.0 "          |
| Discrete  | - | - | - | 11 | - | - | 26.2 "         |
| Mild      | - | - | - | 20 | - | - | 47.6 "         |

Grouping the severer and milder forms together we have:—

Confluent and coherent, 26.0 per cent.

Discrete and mild, 73.8 per cent.

Having three primary cicatrices:—

|           |   |   |   |    |   |   |               |
|-----------|---|---|---|----|---|---|---------------|
| Confluent | - | - | - | 5  | - | - | 7.8 per cent. |
| Coherent  | - | - | - | 10 | - | - | 15.6 "        |
| Discrete  | - | - | - | 19 | - | - | 29.7 "        |
| Mild      | - | - | - | 30 | - | - | 46.9 "        |

Grouping the severer and milder cases we have:—

Confluent and coherent, 23.4 per cent.

Discrete and mild, 76.6 per cent.

All the above tables relate to persons over ten years of age. There was no case of a person under ten years of age within either of the classes of which the tables are composed.

Having four or more primary cicatrices:—

| Type of Small-pox. | Under 10 Years. | Over 10 Years. | Proportion at all Ages. |
|--------------------|-----------------|----------------|-------------------------|
| Confluent          | —               | 2              | 2.8 per cent.           |
| Coherent           | —               | 6              | 8.5 "                   |
| Discrete           | —               | 16             | 22.8 "                  |
| Mild               | 2               | 44             | 65.7 "                  |

Grouping them again according to the severer and milder forms we have:—

Confluent and coherent, 11.3 per cent.

Discrete and mild, 88.5 per cent.

281. It is interesting to compare these results with a similar analysis of the *unvaccinated* persons at Leicester who were attacked by small-pox:—

| Type of Small-pox.      | Under 10 Years.      | Over 10 Years.       | At All Ages.         |
|-------------------------|----------------------|----------------------|----------------------|
| Confluent and malignant | 54 or 51.9 per cent. | 25 or 50.0 per cent. | 79 or 51.3 per cent. |
| Coherent                | 23 " 22.1 "          | 13 " 26.0 "          | 36 " 23.3 "          |
| Discrete                | 19 " 18.2 "          | 8 " 16.0 "           | 27 " 17.5 "          |
| Mild                    | 8 " 7.7 "            | 4 " 8.0 "            | 12 " 7.7 "           |

282. Dr. Luff's report on the London outbreak furnishes the following information. App. IV., pp. 7-9 and 17-19.  
He obtained the number of vaccination scars, and also the condition as to foveation in 1,580 cases. He ascertained the area of the vaccination scars in 1,340 cases. The



following table shows the relation between the number of scars and the type of the disease :—

|                     | Discrete. | Severe and Confluent. | Discrete.  | Severe and Confluent. | Discrete.    | Severe and Confluent. | Discrete.   | Severe and Confluent. |
|---------------------|-----------|-----------------------|------------|-----------------------|--------------|-----------------------|-------------|-----------------------|
|                     | One Scar. |                       | Two Scars. |                       | Three Scars. |                       | Four Scars. |                       |
| Under 10 years - -  | 10        | 0                     | 13         | 0                     | 25           | 2                     | 35          | 0                     |
| Over 10 years - - - | 249       | 35                    | 310        | 27                    | 346          | 28                    | 486         | 14                    |

The result may be summarised thus :—

With 1 scar there were 7·4 cases of discrete to 1 case of severe or confluent.

„ 2 scars „ 11·9 cases of discrete to 1 case of severe or confluent.

„ 3 „ „ 12·3 cases of discrete to 1 of severe or confluent.

„ 4 „ „ 37·2 cases of discrete to 1 of severe or confluent.

It will be noticed that the only confluent cases under the age of 10 were in the class with three scars, and that the cases of discrete in the three-scar class under that age were in a proportion of 12·5 to one severe or confluent, or almost exactly the same proportion as in the same class at all ages.

Turning to the fatality we find that there were :—

With 1 scar, 294, of whom 8 died, or 2·7 per cent.

„ 2 scars, 350 „ 12 „ 3·4 „

„ 3 „ 401 „ 5 „ 1·2 „

„ 4 „ 535 „ 6 „ 1·1 „

283. Discriminating now between the scars, according as they were foveated or unfoveated, we obtain the results which appear in the following table :—

| Number of Scars. | Foveated. |                       | Unfoveated. |                       |
|------------------|-----------|-----------------------|-------------|-----------------------|
|                  | Discrete. | Severe and Confluent. | Discrete.   | Severe and Confluent. |
| One - - - -      | 147       | 15                    | 112         | 20                    |
| Two - - - -      | 222       | 7                     | 101         | 20                    |
| Three - - - -    | 261       | 17                    | 110         | 13                    |
| Four - - - -     | 341       | 8                     | 180         | 6                     |
|                  | 971       | 47                    | 503         | 59                    |

An examination of the total numbers shows that in the foveated class 95·3 cases were discrete, while 4·6 were severe or confluent, and that in the unfoveated class 89·5 were discrete, and 10·4 severe or confluent.

284. If the fatality in the two classes be examined we find the following results :—

*Foveated.*

One scar, 162 cases, with 5 deaths, or 3·0 per cent.

Two scars, 229 „ 3 „ 1·3 „

Three „ 278 „ 2 „ 0·7 „

Four „ 349 „ 3 „ 0·8 „

The total, amounting to 1,018 cases with 13 deaths, shows a death-rate of 1·2.

*Unfoveated.*

One scar, 132 cases, with 3 deaths, or 2·2 per cent.

Two scars, 121 „ 9 „ 7·4 „

Three „ 123 „ 3 „ 2·4 „

Four „ 186 „ 3 „ 1·6 „

The total number in this class is 562, with 18 deaths, or a death-rate of 3·2 per cent.



285. With reference to the area of scars, Dr. Luff gives the following information. He divides the scars in respect to their area according as they are under .25 of the square inch, or from .25 to .5 of the square inch, or over .5 of the square inch.

An analysis of the cases, viewed in relation to their area, gives the following results:—

|                     |   |   |   |   |   | Per-centage of Severe and<br>Confluent Attacks. |
|---------------------|---|---|---|---|---|-------------------------------------------------|
| Area under .25      | - | - | - | - | - | 12.6                                            |
| Area from .25 to .5 | - | - | - | - | - | 4.6                                             |
| Area over .5        | - | - | - | - | - | 3.9                                             |

Or, to put the case in another way:—

|                    |                                               |
|--------------------|-----------------------------------------------|
| Area under .25     | there were 6.9 discrete cases to 1 confluent. |
| Area for .25 to .5 | „ 20.3 „ 1 „                                  |
| Area over .5       | „ 24.0 „ 1 „                                  |

286. Examining the fatality in the classes thus divided according to the area of the scars, we have the following results:—

|                     |                                                       |
|---------------------|-------------------------------------------------------|
| Area under .25      | there were 253 cases, with 6 deaths, or 2.3 per cent. |
| Area from .25 to .5 | „ 385 „ 7 „ 1.8 „                                     |
| Area over .5        | „ 702 „ 10 „ 1.4 „                                    |

287. In his report on the Warrington epidemic Dr. Savill divides the vaccinated persons, who bore marks of vaccination, into two classes, which he terms “well vaccinated” and “indifferently vaccinated.” In the well vaccinated class he includes “all persons whose primary vaccination scars are fairly well marked in their foveation (or pitting), and of an aggregate area (irrespective of number) of half a square inch and upwards.” In the indifferently vaccinated class he includes “(a) persons whose primary scars, though foveate, are in the aggregate (irrespective of number) under half a square inch area, and (b) other persons whose primary marks, irrespective of number of size, are entirely non-foveate, and therefore generally indistinct (plain, or flat, or faint).”

App. V., pp. 22 and 28.

The well vaccinated class consisted of 350. The type of disease was distributed as follows:—

|                                   |
|-----------------------------------|
| Of the 350 well vaccinated cases— |
| 58.6 per cent. were mild.         |
| 23.7 „ „ discrete.                |
| 17.8 „ „ confluent.               |
| 2.9 per cent. died.               |

|                                            |
|--------------------------------------------|
| Of the 208 indifferently vaccinated cases— |
| 50.0 per cent. were mild.                  |
| 24.0 „ „ discrete.                         |
| 26.0 „ „ confluent.                        |
| 8.2 per cent. died.                        |

288. Dr. Gayton, in his analysis of the cases of the Homerton Hospital already referred to, furnishes the following particulars:—

2, App. 243-4.

|                                  |                           |
|----------------------------------|---------------------------|
| Of 529 persons with 1 good mark, | 22 died, or 4.1 per cent. |
| „ 649 „ „ 2 „ marks,             | 22 „ 3.3 „                |
| „ 518 „ „ 3 „ „ 12 „             | 2.3 „                     |
| „ 389 „ „ 4 or more good marks,  | 6 died, or 1.5 per cent.  |

289. The following table gives the results derived from Mr. Sweeting’s observations at the Fulham Hospital, divided according to the age periods 0 to 10, and over 10 years of age:—

Q. 3717.

|                      | One Mark. |         |             | Two Marks. |         |             | Three Marks. |         |             | Four and over Four Marks. |         |             |
|----------------------|-----------|---------|-------------|------------|---------|-------------|--------------|---------|-------------|---------------------------|---------|-------------|
|                      | Cases.    | Deaths. | Death Rate. | Cases.     | Deaths. | Death Rate. | Cases.       | Deaths. | Death Rate. | Cases.                    | Deaths. | Death Rate. |
| 0-10                 | 21        | 1       | 4.76        | 29         | 1       | 3.45        | 37           | 0       | 0           | 53                        | 0       | 0           |
| Over 10 years of age | 384       | 41      | 10.68       | 509        | 46      | 9.04        | 459          | 37      | 8.06        | 396                       | 19      | 4.80        |
| At all ages          | 405       | 42      | 10.37       | 538        | 47      | 8.73        | 496          | 37      | 7.45        | 449                       | 19      | 4.23        |



Q. 3722.

290. With regard to the area of the marks, Mr. Sweeting gives the following information:—

|                                | More than $\frac{1}{2}$ square inch total Area. |         |             | Less than $\frac{1}{2}$ square inch total Area. |         |                |
|--------------------------------|-------------------------------------------------|---------|-------------|-------------------------------------------------|---------|----------------|
|                                | Cases.                                          | Deaths. | Death Rate. | Cases.                                          | Deaths. | Death Rate.    |
| 0-10 - - - - -                 | 0                                               | 0       | —           | 11                                              | 0       | 0              |
| Over 10 years of age - - - - - | 60                                              | 3       | 5 per cent. | 240                                             | 40      | 16.6 per cent. |

1, App. 116.

291. Dr. Thorne Thorne handed us a table founded (a) on information given in the 36th volume of the Medico-Chirurgical Society's Transactions by Mr. Marson, as the result of his observations made during the years 1836 to 1851 on 3,094 cases of post-vaccinal small-pox, and (b) on data derived from Mr. Marson's evidence before the Vaccination Committee of 1871, based on a further experience of 10,661 such cases, and covering the years 1852 to 1867.

| Cases of Small-pox classified according to the Vaccination Marks borne by each Patient respectively. | Per-centage of Deaths in each Class respectively; Uncorrected.* |          | Per-centage of Deaths in each Class respectively; Corrected.* |          |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------|---------------------------------------------------------------|----------|
|                                                                                                      | 1836-51.                                                        | 1852-67. | 1836-51.                                                      | 1852-67. |
| 1. Stated to have been vaccinated, but having no cicatrix -                                          | 25.5                                                            | 40.3     | 21.7                                                          | 39.4     |
| 2. Having one vaccine cicatrix - - - - -                                                             | 9.2                                                             | 14.8     | 7.6                                                           | 13.8     |
| 3. Having two vaccine cicatrices - - - - -                                                           | 6.0                                                             | 8.7      | 4.3                                                           | 7.7      |
| 4. Having three vaccine cicatrices - - - - -                                                         | 3.6                                                             | 3.7      | 1.8                                                           | 3.0      |
| 5. Having four or more vaccine cicatrices - - - - -                                                  | 1.1                                                             | 1.9      | 0.7                                                           | 0.9      |
| Unvaccinated - - - - -                                                                               | 37.5                                                            | 35.7     | 35.5                                                          | 34.9     |

\* The terms *uncorrected* and *corrected* are used to signify the inclusion or exclusion of those fatal cases of small-pox in which the patient suffered from some other disease superadded to the small-pox.

292. Reviewing now the evidence on this subject, we observe that at Sheffield there was a distinct diminution in both the fatality and the severity of the disease in proportion to the number of the marks. At Leicester the proportion of severe cases were less as the marks increased in number. The same is true of the experience of the fatality in London hospitals supplied by Dr. Gayton's and Mr. Sweeting's analysis; and the table founded on Mr. Marson's cases affords evidence to the same effect.

Dr. Coupland's experience at Dewsbury differed somewhat. Whilst none of those with one mark died, the deaths were 5.7 in the class with two marks; and whilst none of those with three marks died, the fatality in the four-mark class was 2.3 per cent. It is to be observed, however, that there were only 34 with one mark. The two-mark class was more than four times as numerous, viz., 175. In the three-mark class there were 210, and the fatality in the four-mark class is founded on one death only, the total number of that class being 42.

On examining Dr. Luff's returns with regard to the London epidemic, it will be seen that the fatality in the class with two scars is slightly in excess of the fatality in the class with one scar, being 3.4 as against 2.7. There is, however, a very marked contrast between these two classes and those with three and four scars, the per-centages in which are 1.2 and 1.1 respectively.

293. Taken together, the number of cases, classified according to the marks found on the patients, is very considerable; it exceeds 20,000. Apart from Mr. Marson's cases the number is 6,839. Dealing with this number, they being all cases in which the observations were made in very recent years, and dividing into classes according to the number of marks, we obtain the following result:—

|                                                       |  |
|-------------------------------------------------------|--|
| 1 mark, 1,357 cases, with 85 deaths, or 6.2 per cent. |  |
| 2 marks, 1,971 " " 115 " 5.8 "                        |  |
| 3 " 1,997 " 75 " 3.7 "                                |  |
| 4 " 1,514 " 34 " 2.2 "                                |  |



Dr. Gayton, in his evidence, stated that, in the analyses which he gave of the cases at the Homerton hospital, when he found one good mark and some imperfect marks, he ignored the imperfect marks and only recorded the good one. As the basis of his calculations was not precisely the same as that adopted in the other cases, it may be well to see how the figures would stand if Dr. Gayton's cases be eliminated. We should then have 4,754 cases, distributed as follows:—

|          |            |                 |                  |
|----------|------------|-----------------|------------------|
| 1 mark,  | 828 cases, | with 63 deaths, | or 7·6 per cent. |
| 2 marks, | 1,322      | „ 93            | „ 7·0 „          |
| 3 „      | 1,479      | „ 63            | „ 4·2 „          |
| 4 „      | 1,125      | „ 28            | „ 2·4 „          |

We think it is of importance to ascertain the effect of combining in this way the information obtained from different observers. The greater the number of cases in which the comparison can be made, the less opportunity is there for the undue influence of any accidental circumstance, and consequently the higher is the value of the result.

There is no doubt some room for error. It may be that the number of scars was by accident incorrectly recorded, or even that some which had existed had ceased to be apparent. But it is not probable that either of these causes of error can have much influenced the result. Moreover, if there be no connexion between the degree of protection and the number of vaccination marks, there is no reason why chance errors of classification should have led to the appearance of a higher fatality in those with fewer vaccination marks rather than to the opposite result.

294. Upon the whole, then, the evidence appears to point to the conclusion that the greater the number of marks the greater is the protection in relation to small-pox enjoyed by the vaccinated person. This further indication also seems to be afforded, that whilst the distinction in this respect between those with one and those with two marks is not very great, there is a very marked contrast between those with four or even with three marks as compared with those with either one or two.

295. The view which attributes a different protective effect to vaccination according to the number of marks receives confirmation from an examination of the type of the disease from which those with one, two, three, or four marks suffered. The particulars given in the Sheffield, Leicester, and London reports afford an indication that the disease varies in its severity inversely as the number of the vaccination marks.

296. There does not appear to be evidence of the same importance to show that foveation of the vaccination marks indicates a condition of better protection in the vaccinated person, though the facts we have detailed may be said, on the whole, to tend in that direction. The only reports which deal directly with this point are those relating to Dewsbury and London. In the former case the numbers are small and the result shown is by no means conclusive. In the latter, both as regards fatality and mildness of the disease, the foveated class show a distinct advantage over the unfoveated.

At Warrington, Dr. Savill based his discrimination into two classes of well and indifferently vaccinated, upon a consideration of the condition of the persons as regards area and foveation combined. There was a very marked distinction in the fatality of the two classes and a distinction, though less marked, in the type of disease from which they suffered.

297. As regards the area of the vaccination marks, though the classification adopted was not quite the same, Dr. Coupland in Dewsbury, Dr. Luff in London, and Mr. Sweeting at the Fulham Hospital, all found some evidence of superior protection according as the area of the vaccination marks was larger. This will be seen by a reference to the statistics quoted above.

298. The investigation of this matter and of the relation between foveation and the protective power of vaccination has, however, been of a range so much more limited than the inquiry into the connexion between the number of marks and its protective power that the results furnish material of less value, and any conclusions drawn from them must necessarily be of less weight.



*As to re-vaccination.*

299. The subject of re-vaccination, to which we have already alluded, is obviously one of great importance. If vaccination exercises a protective influence which diminishes in its effect after the lapse of some years, it is of moment to ascertain whether that influence can be restored by a repetition of the vaccine operation. Moreover, if it should be found that re-vaccinated persons are more favourably situated with reference to an attack of small-pox than unvaccinated persons or than persons vaccinated only in infancy, this would obviously have a direct bearing on the disputed question whether vaccination has a protective influence.

300. Unfortunately it is not possible to obtain any statistics showing the amount of re-vaccination in this country generally. It is certain that it varies greatly in different towns, and the amount is probably not anywhere large, in proportion to the number of the population who have passed the age of childhood. The proportion of re-vaccinated persons to the population almost certainly increases in any town immediately after it has been visited by an epidemic of small-pox. A panic then arises which leads many people to resort to vaccination.

301. In the towns where the epidemic outbreaks of small-pox were investigated, an endeavour was made, amongst other particulars, to ascertain the facts with regard to re-vaccination.

Q. 1904,  
2035-7.

In the borough of Sheffield, during the epidemic of 1887 to 1888, Dr. Barry appealed through the public press and to medical men practising in Sheffield for information as to any cases in which persons had been attacked by small-pox after re-vaccination. It was reported to him from all sources that 352 persons had been so attacked from the beginning of the epidemic to March 31, 1888. Dr. Barry personally inquired into all these cases. Twenty-three of them had removed and could not be traced. Of the 329 who were inspected, it was ascertained that some had not been attacked by small-pox, that others had never been vaccinated at all, or had been vaccinated or re-vaccinated during the incubative stage of small-pox, whilst some had been re-vaccinated during recovery from small-pox.

Forty-eight, or 4·6 per cent., had been re-vaccinated unsuccessfully, whilst 26 only had been re-vaccinated successfully prior to the incidence of small-pox. In addition to those inspected, one person, who had been successfully re-vaccinated, was fatally attacked by small-pox in 1887. The number of persons found to have been attacked by small-pox after successful re-vaccination was thus 27 in all.

Of the 27 cases of small-pox after re-vaccination at Sheffield, one ended fatally. He had been re-vaccinated in 1869. In 19 of the 27 re-vaccinated persons the disease was of an extremely mild character; in two there was a copious eruption, but no pitting ensued; in three others the attack was severe, and was followed in two of them by slight pitting, and in the third by bad pitting; in two others it was doubtful whether they were genuine cases of small-pox. The fatal case has just been referred to.

302. In speaking of re-vaccination it is necessary to distinguish between cases in which the operation has been performed without result and cases of successful re-vaccination. It is only when the vaccine virus has induced vaccinia that a person can properly be called re-vaccinated. The term is, however, often applied where the attempt to re-vaccinate has failed. In that case the subject of the operation has acquired no more protection by the process than if re-vaccination had never been attempted. No doubt the want of success shows, if the operation has been thoroughly performed, that the person is at the time insusceptible to the virus, and, it may be, to the virus of small-pox also. But this condition of insusceptibility is not necessarily permanent, and it is impossible to predicate how long it may last. Moreover, experience shows that where re-vaccination has led to no result, a repetition of the process after the lapse of a few days only may produce the normal features of successful re-vaccination. A single unsuccessful attempt at re-vaccination cannot therefore be regarded as an indication of insusceptibility unless of the most transient nature. Where re-vaccination is not successful, this may be due on the one hand to insusceptibility produced by the previous vaccination, or, on the other hand, to impotency of the operation caused by the imperfection of the lymph used or by want of skill on the part of the operator. Where re-vaccination, unsuccessful at the first attempt, is successful when the operation is repeated after a short interval, there is strong reason for thinking that the want of success was due to the latter and not to the former cause.



If a re-vaccination is unsuccessful it ought not from that fact to be taken for granted that immunity is certain, but the operation should be repeated once or even twice, as in the case of failure of primary vaccination in infants.

303. In the census, to which we have already alluded, taken at the time of the epidemic in Sheffield, the number of persons re-vaccinated was enumerated. They amounted to 64,431. Estimating the attack-rate amongst this class, of whom 27 were attacked by small-pox, we find it to be 0.04 per cent. Q. 2037-9.

The attack-rate of vaccinated persons over the age of 10 years enumerated in the Sheffield census was 1.9, and of unvaccinated persons of a similar age was 9.4.

The fatality per cent. of vaccinated persons attacked above the age of 10 years was 5.1, of unvaccinated persons 54.2. The one death among the 27 re-vaccinated gives a fatality of 3.7.

304. It is important in connexion with the subject we are considering to state the result of the inquiries into the cases of second attacks of small-pox which were made in the course of the investigations of the circumstances relating to the local small-pox epidemics at Sheffield and elsewhere. We have already pointed out that an attack of small-pox, though in general protecting against a subsequent attack, does not confer an absolute immunity. The view that it did practically confer such an immunity was very prevalent at the beginning of the present century. It was not, however, universally held. Jenner gives the details of a case, as one among many others, showing that a second attack may occur, though he admits that it is so rare as to be regarded as a phenomenon. Other writers, such as Monro (*Observations on the different kinds of Small-Pox*, 1818), Thomson (*An Account of the Varioloid Epidemic in Edinburgh*, 1820), and Cross (*On Variolous Epidemics*, 1820), describe it as not uncommon. Indeed the evidence that second attacks do occur is beyond dispute. With regard to the frequency of such attacks, the only exact evidence available is that relating to the Sheffield epidemic, furnished by Dr. Barry, to which we are about to refer.

305. In the Sheffield census, 18,292 persons were reported as having suffered from small-pox prior to 1887. Of these, 23 were attacked during the epidemic of 1887-88. It will be seen, therefore, that the attack-rate was 0.13 per cent. Five of the persons attacked died. Both the attack-rate and the fatality were higher in the class which had previously suffered from small-pox than in the re-vaccinated class. Q. 2040.

With respect to the fatality of a second attack of small-pox, it may be noted that in many of the individual cases recorded, as in the special case quoted by Jenner, the second attack was fatal. Thomson, in the work already referred to, speaks of the fatality of attacks of small-pox after small-pox as being comparatively greater than that of small-pox after vaccination. It will be observed that in Sheffield the fatality, shown by the figures, was very high, being 5 out of 23, or 21.7 per cent. In Dewsbury, Warrington, and Leicester, however, there were 12 cases of a second attack of small-pox without a single fatal result. If these be added to the Sheffield figures it gives 35 cases with 5 deaths, or a per-centage of 14.2.

It has been pointed out that the immunity in relation to small-pox acquired by a previous attack of that disease thus differs from that derived from cow-pox in that while the incidence or attack-rate in the former case is much lower than in the latter, the fatality is much higher, and it has been suggested that this want of correspondence raises a doubt as to whether in the latter case there is a real immunity. Such a purely theoretic objection, even if valid, could not have great weight. In our want of knowledge as to the exact chain of events within the body which bring about immunity, differences, such as the above, in certain characteristics of the immunity are negligible in comparison with the facts indicating that the immunity does exist. But it is not a valid objection, since the figures relating to small-pox after small-pox, as compared with those of small-pox after cow-pox, are far too small to allow of any confidence in a comparison between the two. Again, the figures are so small as to justify an examination of the individual cases. Now, in two of the five deaths recorded by Dr. Barry, the cause of death was, so to speak, accidental; the patients in delirium exposed themselves to cold, and presumably would not otherwise have died. In a third case death was from apoplexy, which is not a natural part of the small-pox disease. Of course, where large numbers are dealt with, all such accidental circumstances may be neglected; their effects are neutralised by the numbers; but in such small numbers they may justly be taken into account. If this is done, the five deaths really due to small-pox are reduced to two, and the fatality becomes quite low. It may be added that only one of these five deaths is a clear example of death by a second attack of

App. III.,  
p. 125;  
App. V.,  
pp. 48 and  
28; App.  
VI., p. 22.

Report on  
an epidemic  
of small-pox  
at Sheffield  
during  
1887-88,  
pp. 46, 87,  
and 157.



small-pox uninfluenced by other circumstances, the individual having certainly had small-pox, and never having been vaccinated, for the other death was a case in which the evidence of the first attack was inadequate, and which had been vaccinated.

It would appear, then, that such statistics as we possess do not corroborate the impression which is apt to be made by the scattered records of the individual cases of second attacks; owing to so many of these having a fatal issue. Indeed, many at least of these fatal second attacks may perhaps be regarded as instances of exceptional susceptibility.

On the whole, we think the evidence tends to show that there is no such want of analogy in the immunity secured by a previous attack of small-pox or by cow-pox as to constitute a valid objection to the reality of the immunity conferred by cow-pox.

App. III.  
pp. 119-20. 306. Turning now to Dewsbury, we obtain the following information from Dr. Coupland's report:—

There were 14 individuals attacked by small-pox during the epidemic who were said to have been re-vaccinated. In four, at least, of the 14 cases the re-vaccination appears to have been unsuccessful. We have already pointed out that these cannot be regarded as cases of re-vaccination. In five of the other cases there was no definite evidence shown of re-vaccination; in another case the re-vaccination was not performed until one day after the appearance of the rash of small-pox; whilst in three other cases the re-vaccination was only from twelve to eight days prior to the attack, when, therefore, the small-pox virus was already at work.

In the remaining case, where the vaccination had preceded the attack by three weeks, the disease was of a mild character. There were only two confluent cases (one of them being a fatal case) amongst those said to have been re-vaccinated, in neither of which was there definite evidence re-vaccination having been successfully performed.

App. VI.,  
60-2. 307. In Leicester, during the epidemic, in a group of 133 houses with 842 inmates, of whom 141 were attacked, there were 84 re-vaccinated persons, of whom one was attacked by small-pox. In another group of 60 houses with 392 inmates, of whom 179 were attacked, there were 31 re-vaccinated persons, of whom five were attacked.

We notice that in the first group of houses the attack-rate in the vaccinated class was 14·6 per cent.; amongst the re-vaccinated it was 1·1.

Dealing in a similar way with the second group of houses, which were more intensely infected than the other group, and where the attack-rate was consequently higher, we find that out of 31 re-vaccinated persons five were attacked, or a rate of 16·1 per cent., whilst amongst the vaccinated it was 35·3, and amongst the unvaccinated 59·6.

App. IV.,  
pp. 6 and  
17. 308. In London Dr. Luff reported the number of attacks of re-vaccinated persons to have been 108, with four deaths, showing a fatality of 3·7. The fatality shown amongst vaccinated persons above the age of 10 in the same epidemic was 4·2. The fatality amongst the unvaccinated of a similar age was 20·9.

The character of the disease in the re-vaccinated class was reported to be mild in 101 cases, and severe in seven.

App. V., pp.  
27 and 43. 309. At Warrington in the invaded houses there were 64 re-vaccinated persons. Of these 8 or 12·5 were attacked. The per-centage of unvaccinated persons attacked in the same houses was 56·0 per cent., and of vaccinated persons over 10 years of age 29·9 per cent. There were in those houses 41 persons who had previously had small-pox. Of these five were attacked, or 12·1 per cent. There was no death either in the re-vaccinated class or amongst those who had previously suffered from small-pox.

310. The reports from which we have just quoted throw light in other ways upon the effect of re-vaccination.

Q. 2027. The average strength of the troops stationed at Sheffield during 1887-8 was about 830 of all ranks. The whole of these were, or should, in accordance with the Army regulations, have been at one time re-vaccinated or vaccinated in the exceptional cases where they had not been previously vaccinated. Twelve men, or 1·4 per cent. of the total strength, contracted small-pox, and of these one died. Not one of the soldiers who contracted small-pox had been *successfully* re-vaccinated. During the period of the epidemic the men mingled freely with their friends in the town, and although the neighbourhood of the barracks was one of the first localities invaded by the disease, no successfully re-vaccinated soldier quartered in Sheffield suffered from small-pox.



311. Turning now to the incidence of the disease upon the police force of the borough of Sheffield, it appears that there were 372 men of all ranks. Of these 10 constables contracted small-pox. These men, though vaccinated in infancy, had not been re-vaccinated. On 10th February 1888 the Chief Constable issued an order directing the re-vaccination of every man in the force. After that date, down to the time when Dr. Barry made his report, no constable contracted small-pox. It should be observed, however, that the epidemic ceased in the following August, and that rather more than 70 per cent. of the cases occurred before the 25th February. The police, in carrying out their ordinary duties, were of necessity frequently brought into close relation with infected persons and things. Q. 2027-8.

312. There were at the time of the epidemic 290 men and boys employed on the permanent staff of the Sheffield Post Office. The Post Office regulations require re-vaccination before engagement. Dr. Barry truly points out that the duties of letter carriers, telegraph boys, &c. continually bring them into personal contact with infected persons and things, yet no member of the permanent staff of the Post Office contracted small-pox. Q. 2029.

313. The facts relating to the attendants in small-pox hospitals deserve close attention. Many of them spend their time in what may be termed a hot bed of contagion. They are in constant personal contact with persons suffering from the disease. There are others who, though not themselves necessarily in actual contact with the sick, are in constant communication with attendants on small-pox cases.

314. During the year ending 31st March 1888 four hospitals were used in Sheffield for the treatment of acute cases of small-pox. The bed accommodation in these four hospitals was 315, and 1,798 patients were treated in them in the course of that year. Some of these patients when convalescent were transferred to a fifth hospital, with 60 beds, which was used during part of the year for convalescent small-pox patients only. In these hospitals the total number of attendants in personal contact with the sick was 140. There were 21 other persons in constant communication with these attendants. Of these 161 persons 18 had suffered from small-pox prior to the epidemic, and none of the 18 contracted the disease again. One other had been vaccinated in infancy, and was re-vaccinated unsuccessfully on entering the hospital for convalescents, but successfully some days later; 14 days after entering the hospital she had a very mild attack of small-pox, which did not necessitate her going to bed. Sixty-two others had been vaccinated in infancy only, of whom six contracted small-pox, and one died. Of the remaining 80, all of whom had been successfully re-vaccinated, not one contracted small-pox. Q. 2029-30; 19,905-7; 28,799-804.

315. At Warrington a force of 300 regular troops and 200 militiamen resided in the barracks in the N.E. corner of the town. In addition to these, 80 women and about 213 children resided in barracks. The only case of small-pox among the inhabitants of the barracks, numbering some 800 persons, occurred in the case of a militiaman. Although all recruits to the regular troops are re-vaccinated on joining, Dr. Savill was informed that this was not the rule with militia recruits, who are not re-vaccinated unless their marks are imperfect. The practice is the same as regards the women and children residing in barracks. At the time of the epidemic an inspection was made by the surgeon in charge, and re-vaccination performed wherever the original marks were reported not good. App. V., p. 44.

316. No cases of small-pox were reported as occurring either in the police force or the postal service, in both of which re-vaccination was extensively practised either before or during the panic.

317. Only two members of the staff of the Aikin Street Hospital, where small-pox patients were treated, were attacked by small-pox. They were the only two members of the staff who were not re-vaccinated at the commencement of the outbreak. Dr. Savill adds in a note, that one of these subsequently stated she was re-vaccinated a few days before the eruption, but if, as would appear, this was after the small-pox virus had begun its work the circumstance is not material. App. V., pp. 44 and 11.

318. The largest number of cases of small-pox in any place of employment in the town arose at the Dallam and Bewsey Ironworks, which were situate near the temporary small-pox hospital. The disease first attacked persons employed at these works during the last week in August 1892. Dr. Savill states that there was at first some apathy App. V., pp. 20, 44, and 75.



and opposition on the part of the workmen to the practice of vaccination; they could not be persuaded of the necessity. However, the sick fund committee of the works, *i.e.*, a committee of the men's representatives, acting on the suggestion of the manager and the medical officer of the works, passed the following resolution on November 12, 1892: "That any member who remains unrevaccinated after Monday, November 21st, 1892, shall not be entitled to any sick benefit should he be afflicted with "small-pox." The expense of re-vaccination was borne by the sick fund.

The medical officer states that, as a consequence of this, between 1,400 and 1,500 hands were re-vaccinated during the last two weeks of November, and a good many others were vaccinated by their private doctors.

After the second week in December, when the vaccination would have become effectual, there were down to the end of the epidemic only 12 cases of small-pox. Dr. Savill states that he was informed by the Medical Officer of Health that these were in the case of men who had either refused re-vaccination or joined subsequently.

App. VI.,  
page 33.

319. At Leicester, at the end of the year 1892, the staff at the hospital consisted of 28 persons. Fourteen of these had either previously had small-pox or had been re-vaccinated before the outbreak. Eight others were vaccinated at the time of the outbreak. The remaining six, although they had not previously been re-vaccinated, refused to submit to the operation. During the outbreak there was an addition of 12 to the staff dealing with small-pox cases. These were all re-vaccinated, and none of them contracted small-pox. Out of the 28, six were attacked by the disease, of whom one died. Five of the persons thus attacked, including the one fatal case,\* were amongst the six persons who had refused to be re-vaccinated, though in the case of one of the five consent was afterwards given to the operation, but it was only performed on the day that she showed premonitory symptoms of small-pox. The sixth case, a mild one, was that of a nurse who had been re-vaccinated 10 years before.

Q. 1719-26,  
1795-6.

320. Dr. Gayton gives the following facts as regards small-pox among the hospital staff at the Homerton Small-pox Hospital. From 1st February, 1871, the date when the hospital opened for the reception of patients, to the end of 1877, 366 persons had been employed in the hospital. All of these were re-vaccinated on commencing duty, with the exception of an assistant nurse, who was not brought under Dr. Gayton's notice for some reason until after she had been in the wards. This woman in a fortnight was down with small-pox, and passed through a severe attack, but recovered. Dr. Gayton was unable to give the exact number employed in the years subsequent to 1877, but he thought it might be fairly estimated that an equal number were engaged in the work. There was only one person attacked among these, she had not been re-vaccinated. A third case occurred, in which a nurse engaged in the hospital was attacked. She was sent into a ward on 27th February 1880 after being re-vaccinated. On 3rd March the operation, being evidently a failure, was repeated. On 7th March, however, she presented symptoms of small-pox.

In the small-pox ship-hospitals of the Asylums Board during the 12 years 1884-95, among the attendants (doctors, nurses, and servants), varying in numbers from below 50 during the year to a little over 300, cases of small-pox have occurred in three years only, in 1884, in 1892, and in 1893; in all the other years there were no cases at all. In 1884, with 283 attendants employed, there were four cases; in 1892, two cases among 138 attendants; in 1893, six cases among 320 attendants. It is a striking fact that in all these years there should have been so few attacks of the disease amongst so many persons who were in a remarkable way exposed to contagion, for the exposure to contagion in a ship-hospital is very great. It is to be observed that in one of these cases the disease appeared within three days of her entering the hospital; in another nine days, in four others ten days, and in four others twelve to fifteen days after they joined the staff. None of the recorded cases appear to have been re-vaccinated successfully prior to the period of incubation of the small-pox, though the operation was in all cases attempted shortly after joining.

Q. 3733,  
3775-92,  
3799.

321. Mr. Sweeting gives the following statistics on the same point with reference to the Western Hospital, formerly the Fulham Hospital:—The total staff, during the time the hospital has been in use, is stated by him to have been 362, of whom one half, roughly speaking, were habitually employed in the wards. Of the 362, 48 had had small-pox before they came into the hospital. Of 314 persons who had never had small-pox, seven contracted the disease. Two of these seven had not been re-vaccinated on entering the hospital, owing to some oversight. Two were unsuccessfully re-vaccinated, one of these being a case of second small-pox; another was not re-vaccinated

\* The person in whose case the disease was fatal was said to be of intemperate habits.



early enough, as the operation was not performed until the fifth day ; and in the other two cases there is no record of any result. These occurred in his predecessor's time. The total staff employed in ambulance duty was 42. Of this number only one took the small-pox. He was not re-vaccinated, his arrival not having been reported. He contracted the disease 13 days after he arrived on duty.

322. Mr. Marson, surgeon to the Highgate Small-pox Hospital, giving evidence in 1871 before the Select Committee, stated that during the preceding 35 years no nurse or servant at the hospital had been attacked with small-pox. Since then, up to the present time, one case only, that of a gardener, has occurred, so that there is now a record of nearly 60 years with one case only. Of the 137 nurses and attendants who have been taken on since May 1883, 30 had had small-pox previous to their entering the service. (Some of these were patients in the hospital, engaged as nurses or ward maids after their recovery.) All the others were re-vaccinated upon entering the service, with the exception of the one case, the gardener, who took the disease.

323. Some stress has been laid upon a statement made by Mr. Porter, who was for a short time medical officer at the South Dublin Union Hospital in 1871, that " the experiment of not re-vaccinating the nurses was tried at the small-pox hospital at the South Dublin Union in 1871-2; 29 out of the 36 attendants had not been re-vaccinated, and these all escaped small-pox as well as the other 7." It appears that Mr. Porter's employment at the hospital lasted only about a week, and although he states that he made some inquiry or examination as to whether these 29 persons had previously suffered from small-pox, he admits that he knew nothing on this point except " in a general way." He " did not make a very minute inquiry." It had been usual, he thinks, before he went to the hospital to re-vaccinate the nurses, though he does not think it was compulsory. He could give no information as to why these nurses, who were at the hospital before he came there, had not been re-vaccinated. He seems to have made no inquiry on the point. The statement was originally made in a paper read by Mr. Porter before a Medical Society in the year 1872. There was no reference in this paper to the question whether the nurses not re-vaccinated had previously suffered from small-pox. Upon the whole, then, it cannot be regarded as certain that none of the 29 nurses referred to had suffered from small-pox, even if it is to be taken as a fact that they were none of them re-vaccinated.

Q. 22,190.  
22,207-29,  
22,239-321.

324. It is not easy to understand why so much stress has been laid on the fact, if fact it be, that at a particular hospital 29 attendants who had neither been re-vaccinated nor suffered from a previous attack of small-pox escaped the disease. It cannot be treated as an isolated experience, it must be considered in conjunction with the facts relating to other hospitals and to small-pox generally. If the inference suggested be that in the other instances it was a mere chance that the re-vaccinated showed immunity from the disease, and that they would have displayed the same immunity if they had not been a second time vaccinated, the facts seem to render such an inference impossible. At the Sheffield hospitals out of 62 attendants who had only been vaccinated in infancy, six contracted small-pox, as did another attendant who had been vaccinated in infancy and was not successfully re-vaccinated until incubating small-pox, whilst of the 80 others who had been re-vaccinated not one suffered. At War-rington two members of the hospital staff were attacked, being the only members who had not been re-vaccinated at the commencement of the outbreak. At Leicester, of the six attendants who refused to be re-vaccinated, five contracted small-pox and one died; whilst there was only one case of the disease, a mild one, amongst the larger number who had submitted to the operation, that of a nurse re-vaccinated ten years before. At Homerton almost all the hospital attendants were re-vaccinated, but three, on whom the operation had not been successfully performed, suffered from the disease. In Fulham Hospital seven of the attendants were attacked. None of them appear to have been successfully re-vaccinated. Dr. Grimshaw, the Registrar-General for Ireland, states that in the Cork Street Hospital, Dublin, with which he was at one time connected, all the officers and servants in the institution were re-vaccinated with the exception of one resident pupil, who refused to be re-vaccinated; he died of small-pox.

Q. 3000.

325. It will be seen, therefore, that if the hospital experience be regarded as a whole, there is clear evidence that whilst the re-vaccinated attendants escaped small-pox, many of those who had neither passed through an attack of small-pox nor been re-vaccinated were attacked by the disease. It is true that it cannot be asserted that persons employed in hospitals as medical men or attendants, even if re-vaccinated, enjoy an absolute immunity from the disease. There are instances of such persons having been attacked, but they have been so rare and exceptional as not substantially to modify the conclusion otherwise arrived at,



326. If the inference proposed be that attendants in a small-pox hospital enjoy, quite apart from vaccination, an immunity from the disease which is not shared by those who under other circumstances come within the reach of contagion, any such hypothesis seems to be equally inadmissible when the facts just alluded to are properly weighed. It is indeed not easy to understand why attendants in a hospital coming into constant contact with small-pox patients should be subject to less risk of contagion than those who nurse a member of their own family, or who are in communication with persons so engaged. Yet there is abundant evidence that contagion is constantly conveyed under these circumstances. The invasion of a house by a single case frequently leads to other attacks in the same house. There have been frequent attacks of small-pox among patients suffering from other diseases who have been inmates of a hospital a part of which has been used for small-pox patients. And there is strong evidence that small-pox hospitals have been the cause of a spread of the disease in houses in their proximity. These considerations must surely create a doubt whether what has been stated with regard to the South Dublin Union Hospital can be relied on as accurate, the more so when we find that the circumstances were not made the subject of careful and complete inquiry.

327. Our attention has been called to the experience at the Bicêtre Small-pox Hospital at Paris, recorded by M. Colin. It has been said that this shows that whilst out of 200 attendants, nearly all of whom were re-vaccinated under his eyes, 15 were attacked by small-pox with a fatal result in one case, there was not a single case of small-pox among 40 doctors and chemists and 40 nurses, nearly all of whom refused to be re-vaccinated. M. Colin's book does not enable us to arrive at a precise knowledge of the facts. The statements with reference to these incidents are found at different parts of it. It is stated that out of nearly 200 attendants on the hospital staff, almost all of whom were vaccinated under M. Colin's eyes, only some 15 were attacked by small-pox. It is to be observed that we are not told what was the number of those who were not re-vaccinated; for aught that appears, all or many of the 15 cases may have been amongst these. Moreover, unless M. Colin followed up the matter and ascertained that in the case of all the persons re-vaccinated under his eyes the operation had been successful, it is not certain that this was always the case. The experience gained by a study of the subject of re-vaccination elsewhere suggests caution on this head. On another page of M. Colin's book we find the statement that there was not a single attack of small-pox amongst the 40 doctors and chemists attached to the establishment in spite of the neglect of the majority of them to be re-vaccinated, and not a single attack amongst the 40 nurses who attended the small-pox patients. It will be noticed that this statement with reference to the neglect of re-vaccination is confined to the 40 doctors and chemists. Further, it is not certain whether it is intended to state that they had never been re-vaccinated, or merely that they had not submitted to the operation though advised to do so when they commenced their work at the hospital. In a subsequent passage where the fact that the doctors and chemists, and the nurses referred to, escaped small-pox is mentioned, it is added, "a large number of these persons, however, were not willing to yield to the advice I gave them to be re-vaccinated."

328. We do not think that the statements of M. Colin materially affect the weight of the evidence derived from hospital experience in this country. It will, of course, be noticed that both the Dublin and Paris cases only bear on the question of the value of re-vaccination as compared with primary vaccination; there is nothing to show that any of the persons who escaped the disease were unvaccinated.

It should be added that Dr. Ogle and others have called attention to the immunity enjoyed by medical men, who are largely a re-vaccinated class, from attacks of small-pox as compared with other contagious or infectious diseases.

329. It has been suggested that the true reason why those engaged in constant attendance in small-pox hospitals enjoy so exceptional an immunity from the disease, when the probabilities seem in favour of a risk much graver than the ordinary one, is this, that by a long and gradual exposure to the influence of the poison, the human frame becomes torpid in its action. But the facts do not support this explanation.

In the first place the exposure to the poison is not gradual, and further, this theory does not explain the phenomenon that the re-vaccinated so largely escape the disease as compared with those who have not been re-vaccinated.

Moreover, the experience of almost certain immunity from the disease in the case of successfully re-vaccinated attendants in small-pox hospitals has no parallel in the case of other contagious or infectious diseases.



Typhus fever is in many respects comparable with small-pox, especially in its contagiousness and in its attacking adults. Now at the London Fever Hospital during the period 1862-71, when large numbers of typhus patients were treated, the average number of attendants (including laundry-women) employed either temporarily or otherwise in the course of a single year was about 100, and the average number of cases of typhus occurring in a year amongst that staff was 19·2. It must be remembered that all these attendants were not employed in the typhus-wards; were it possible to obtain the separate figures of the number employed in those wards, the attack-rate would doubtless be higher. We are unable to state the exact proportion of the persons forming from time to time during the period 1862-71 the medical staff of the Hospital, who were attacked with typhus, but the following may be given as an instance of what at times happened. In 1862, the resident medical officer and a gentleman who temporarily discharged his duties both caught typhus; in the following year, the resident medical officer and three gentlemen who successively acted as his assistant all caught typhus; in the following year, the assistant resident medical officer, and in the year following that, another medical officer contracted the disease, while in the next year (1866) a resident medical officer took it and died. So great was the risk at that time of a new medical officer taking typhus, that each candidate was warned by the authorities of the danger to which he was exposing himself.

Neither scarlet fever nor measles can now, in respect to the question at issue, be compared with small-pox; since, as regards these two diseases, the proportion of adults protected by a former attack (in infancy) is one by the side of which the proportion in recent years of adults protected by a former attack of small-pox sinks into insignificance.

At the London Fever Hospital, since the time that typhus has almost disappeared, the cases of fever have been principally those of scarlet fever, and hence now among the medical staff and nurses the attacks of fever are comparatively few in number. In fact, the behaviour of scarlet-fever towards a hospital staff becomes comparable with that of small-pox, only on the hypothesis that a thoroughly good vaccination places a person towards small-pox in a position very similar to that which the having already had the disease places a person towards scarlet-fever.

Typhoid fever cannot fairly be compared with small-pox, since the mode of contagion is different. Nor are there records available as to the hospital staffs specially in care of typhoid fever or of diphtheria patients as there are in the case of small-pox. But if the cases of ordinary contagious diseases, such as scarlet fever and diphtheria, be taken together, and even if typhoid fever be included, a striking contrast is afforded by the returns of the Metropolitan Asylums Board between the attendants in the hospitals treating these diseases, and those in the small-pox ship-hospitals mentioned above. This is shown in the following table :—

| YEAR.    | Metropolitan Asylums Board's Fever Hospitals.*                                           |                                                                                  |             | Metropolitan Asylums Board's Small-pox Hospital-ships.                                   |                                                      |               |        |
|----------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------|------------------------------------------------------|---------------|--------|
|          | Number of attendants employed either temporarily or otherwise in the course of the year. | Of whom, there contracted scarlet-fever, diphtheria† or typhoid during the year. |             | Number of attendants employed either temporarily or otherwise in the course of the year. | Of whom, there contracted small-pox during the year. |               |        |
|          |                                                                                          | Number.                                                                          | Proportion. |                                                                                          | Number.                                              | Proportion.   |        |
| 1884 - - | } Figures not available.                                                                 |                                                                                  |             | 283                                                                                      | 4                                                    | 1·4 per cent. |        |
| 1885 - - |                                                                                          |                                                                                  |             | 240                                                                                      | 0                                                    | 0    "        |        |
| 1886 - - |                                                                                          |                                                                                  |             | 110                                                                                      | 0                                                    | 0    "        |        |
| 1887 - - |                                                                                          | 1,103                                                                            | 37†         | 3·4† per cent.                                                                           | 55                                                   | 0             | 0    " |
| 1888 - - | } Figures not available.                                                                 | 35                                                                               | —           | 46                                                                                       | 0                                                    | 0    "        |        |
| 1889 - - |                                                                                          | 42                                                                               | —           | 53                                                                                       | 0                                                    | 0    "        |        |
| 1890 - - |                                                                                          | 1,312                                                                            | 53          | 4·0 per cent.                                                                            | 64                                                   | 0             | 0    " |
| 1891 - - |                                                                                          | 1,160                                                                            | 68          | 5·9    "                                                                                 | 64                                                   | 0             | 0    " |
| 1892 - - | 1,652                                                                                    | 121                                                                              | 7·3    "    | 138                                                                                      | 2                                                    | 1·4    "      |        |
| 1893 - - | 2,175                                                                                    | 121                                                                              | 5·6    "    | 320                                                                                      | 6                                                    | 1·9    "      |        |
| 1894 - - | 2,182                                                                                    | 111                                                                              | 5·1    "    | 289                                                                                      | 0                                                    | 0    "        |        |
| 1895 - - | 2,514                                                                                    | 116                                                                              | 4·6    "    | 274                                                                                      | 0                                                    | 0    "        |        |

\* Excluding the Gore Farm Hospital, opened in 1890. In the years 1893, 1894 and 1895, both scarlet-fever and small-pox convalescent patients were admitted into that hospital, and the only available figures as to the staff do not enable us to distinguish between those employed in or about the fever, and those in or about the small-pox wards.

† Cases of diphtheria, as such, were not admitted into the Metropolitan Asylums Board's hospitals prior to October 1888; though a few cases of that disease, sent in as fever cases, had been admitted in the earlier part of that year and in the previous year. Three attendants who contracted diphtheria in 1887 have not, therefore, been included in the number (37) and proportion (3·4 per cent.) given in the second and third columns of the above table against the year 1887.



Making every allowance on the one hand for the mixed character of the cases in the Fever Hospitals, and on the other hand for doubts about the re-vaccination of some of the staff at the ship-hospital, it is clear that small-pox stands apart from all the other contagious diseases in relation to attacks among the staff.

330. We have already in our discussion of the subject of re-vaccination alluded to its apparent effect in relation both to the military forces stationed at Sheffield and Warrington, and to public officials such as those employed by the Post Office, who by the regulations of the service are required to be vaccinated before entering it. It is needless to say that these are for the most part cases of re-vaccination. It will be expedient now to examine the evidence with regard to the Army and Navy generally.

331. The following table shows the attack-rate of and mortality from small-pox amongst the troops in the United Kingdom during each of the years 1847-1894 :—

*In the  
British  
Army.*

2, App.  
278-9; and  
reports of  
Army Medi-  
cal Depart-  
ment for the  
years 1889-  
1894.

| Year.  | Attacks of Small-pox<br>to every 10,000 of<br>the Strength. | Deaths from Small-<br>pox to every 10,000<br>of the Strength. | Year.  | Attacks of Small-pox<br>to every 10,000 of<br>the Strength. | Deaths from Small-<br>pox to every 10,000<br>of the Strength. |
|--------|-------------------------------------------------------------|---------------------------------------------------------------|--------|-------------------------------------------------------------|---------------------------------------------------------------|
| 1847 - | 18                                                          | 1·0                                                           | 1871 - | 23                                                          | 2·3                                                           |
| 1848 - | 26                                                          | 1·6                                                           | 1872 - | 14                                                          | 1·4                                                           |
| 1849 - | 25                                                          | 3·2                                                           | 1873 - | 1                                                           | ·1                                                            |
| 1850 - | 14                                                          | ·7                                                            | 1874 - | 1                                                           | 0                                                             |
|        |                                                             |                                                               | 1875 - | ·6                                                          | ·1                                                            |
| 1851 - | 14                                                          | ·8                                                            | 1876 - | 3                                                           | ·2                                                            |
| 1852 - | 30                                                          | 2·1                                                           | 1877 - | 3                                                           | ·4                                                            |
| 1853 - | 20                                                          | 2·2                                                           | 1878 - | 2                                                           | ·1                                                            |
| 1854 - | 41                                                          | 4·5                                                           | 1879 - | 1                                                           | 0                                                             |
| 1855 - | 47                                                          | 3·8                                                           | 1880 - | ·4                                                          | 0                                                             |
| 1856 - | 12                                                          | ·4                                                            |        |                                                             |                                                               |
| 1857 - | 12                                                          | 1·0                                                           | 1881 - | 3                                                           | ·2                                                            |
| 1858 - | 32                                                          | 1·8                                                           | 1882 - | 2                                                           | ·1                                                            |
| 1859 - | 24                                                          | 1·0                                                           | 1883 - | 1                                                           | 0                                                             |
| 1860 - | 14                                                          | ·7                                                            | 1884 - | 1                                                           | 0                                                             |
|        |                                                             |                                                               | 1885 - | 2                                                           | ·3                                                            |
| 1861 - | 6                                                           | ·4                                                            | 1886 - | 1                                                           | 0                                                             |
| 1862 - | 8                                                           | ·4                                                            | 1887 - | 1                                                           | ·1                                                            |
| 1863 - | 16                                                          | ·8                                                            | 1888 - | 1                                                           | ·1                                                            |
| 1864 - | 15                                                          | 1·4                                                           | 1889 - | ·2                                                          | 0                                                             |
| 1865 - | 12                                                          | ·8                                                            | 1890 - | 0                                                           | 0                                                             |
| 1866 - | 5                                                           | ·1                                                            |        |                                                             |                                                               |
| 1867 - | 5                                                           | ·1                                                            | 1891 - | ·1                                                          | 0                                                             |
| 1868 - | 9                                                           | ·3                                                            | 1892 - | 6                                                           | 0                                                             |
| 1869 - | 1                                                           | 0                                                             | 1893 - | ·8                                                          | 0                                                             |
| 1870 - | 3                                                           | ·1                                                            | 1894 - | 1                                                           | 0                                                             |

Q. 3450-8;  
3489-99.

332. Since the year 1858 it has been the practice in the army to vaccinate every recruit on joining the service, whether previously vaccinated or not, except those bearing distinct marks of small-pox. During the years following 1858, therefore, as men previously recruited passed from the army, the proportion of the strength who had been vaccinated since enlistment increased; until, in somewhere about ten years' time, the earlier recruits had, with comparatively few exceptions, left the army.

Q. 3500-7.

333. During the period 1847-1858 the death-rate from small-pox amongst the troops in the United Kingdom, though varying from year to year, does not appear to us to have given evidence of decline. Speaking generally of the period 1859-1894, the growth of the proportion of the strength who had been vaccinated since enlistment was accompanied by a decline in the death-rate from small-pox, and the lessened death-rate has on the whole continued during those later years of the period in which that proportion has presumably been maintained at its highest.



334. The following table shows the attack-rate of, and mortality from, small-pox among the British troops in the Colonies from the year 1860 onwards:—

| Year.    | Attacks of Small-pox to every 10,000 of the Strength. | Deaths from Small-pox to every 10,000 of the Strength. | Year.    | Attacks of Small-pox to every 10,000 of the Strength. | Deaths from Small-pox to every 10,000 of the Strength. |
|----------|-------------------------------------------------------|--------------------------------------------------------|----------|-------------------------------------------------------|--------------------------------------------------------|
| 1860 - - | 8                                                     | 1.0                                                    | 1878 - - | 1                                                     | .4                                                     |
| 1861 - - | 12                                                    | .9                                                     | 1879 - - | .3                                                    | 0                                                      |
| 1862 - - | 15                                                    | 2.3                                                    | 1880 - - | 2                                                     | .4                                                     |
| 1863 - - | 5                                                     | 0                                                      | 1881 - - | 0                                                     | 0                                                      |
| 1864 - - | 16                                                    | 1.5                                                    | 1882 - - | 1                                                     | 0                                                      |
| 1865 - - | 12                                                    | 1.1                                                    | 1883 - - | 3                                                     | 0                                                      |
| 1866 - - | 7                                                     | 0                                                      | 1884 - - | .5                                                    | 0                                                      |
| 1867 - - | 8                                                     | 0                                                      | 1885 - - | 1                                                     | 0                                                      |
| 1868 - - | 10                                                    | .3                                                     | 1886 - - | 0                                                     | 0                                                      |
| 1869 - - | 4                                                     | 0                                                      | 1887 - - | 1                                                     | 0                                                      |
| 1870 - - | 8                                                     | 1.3                                                    | 1888 - - | 3                                                     | 0                                                      |
|          |                                                       |                                                        | 1889 - - | 2                                                     | 0                                                      |
| 1871 - - | 51                                                    | 7.0                                                    | 1890 - - | 0                                                     | 0                                                      |
| 1872 - - | .5                                                    | 0                                                      |          |                                                       |                                                        |
| 1873 - - | 3                                                     | .5                                                     | 1891 - - | 2                                                     | 0                                                      |
| 1874 - - | 2                                                     | 0                                                      | 1892 - - | 0                                                     | 0                                                      |
| 1875 - - | 5                                                     | 0                                                      | 1893 - - | 2                                                     | 0                                                      |
| 1876 - - | 0                                                     | 0                                                      | 1894 - - | 1                                                     | 0                                                      |
| 1877 - - | .4                                                    | 0                                                      |          |                                                       |                                                        |

2, App. 278  
and reports  
of Army  
Medical  
Department  
for the years  
1889-1894.

335. The following table shows the attack-rate of, and mortality from, small-pox amongst the British troops in India during the same period:—

| Year.    | Attacks of Small-pox to every 10,000 of the Strength. | Deaths from Small-pox to every 10,000 of the Strength. | Year.    | Attacks of Small-pox to every 10,000 of the Strength. | Deaths from Small-pox to every 10,000 of the Strength. |
|----------|-------------------------------------------------------|--------------------------------------------------------|----------|-------------------------------------------------------|--------------------------------------------------------|
| 1860 - - | 25                                                    | 2.9                                                    | 1878 - - | 12                                                    | 2.3                                                    |
| 1861 - - | 40                                                    | 6.1                                                    | 1879 - - | 6                                                     | .6                                                     |
| 1862 - - | 6                                                     | .8                                                     | 1880 - - | 1                                                     | .2                                                     |
| 1863 - - | 8                                                     | 1.8                                                    |          |                                                       |                                                        |
| 1864 - - | 21                                                    | 2.9                                                    | 1881 - - | 3                                                     | .2                                                     |
| 1865 - - | 21                                                    | 2.6                                                    | 1882 - - | 8                                                     | .7                                                     |
| 1866 - - | 6                                                     | 1.0                                                    | 1883 - - | 19                                                    | 1.6                                                    |
| 1867 - - | 8                                                     | .9                                                     | 1884 - - | 14                                                    | 1.4                                                    |
| 1868 - - | 8                                                     | 0                                                      | 1885 - - | 2                                                     | 0                                                      |
| 1869 - - | 28                                                    | 3.2                                                    | 1886 - - | 4                                                     | .2                                                     |
| 1870 - - | 4                                                     | .9                                                     | 1887 - - | 6                                                     | .3                                                     |
|          |                                                       |                                                        | 1888 - - | 15                                                    | 1.5                                                    |
| 1871 - - | 2                                                     | .2                                                     | 1889 - - | 22                                                    | 2.5                                                    |
| 1872 - - | 9                                                     | 1.9                                                    | 1890 - - | 5                                                     | .6                                                     |
| 1873 - - | 14                                                    | 1.9                                                    |          |                                                       |                                                        |
| 1874 - - | 8                                                     | 1.3                                                    | 1891 - - | 2                                                     | .2                                                     |
| 1875 - - | 2                                                     | .3                                                     | 1892 - - | 3                                                     | .4                                                     |
| 1876 - - | 3                                                     | 0                                                      | 1893 - - | 5                                                     | .6                                                     |
| 1877 - - | 7                                                     | .3                                                     | 1894 - - | 2                                                     | .4                                                     |

2, App. 278 ;  
and reports  
of Army  
Medical  
Department  
for the years  
1889-1894.

336. The following table shows the attack-rate of, and mortality from, small-pox amongst the British troops in Egypt during the years from 1882 onwards:—

| Year.    | Attacks of Small-pox to every 10,000 of the Strength. | Deaths from Small-pox to every 10,000 of the Strength. | Year.    | Attacks of Small-pox to every 10,000 of the Strength. | Deaths from Small-pox to every 10,000 of the Strength. |
|----------|-------------------------------------------------------|--------------------------------------------------------|----------|-------------------------------------------------------|--------------------------------------------------------|
| 1882 - - | 5                                                     | 0                                                      | 1889 - - | 122                                                   | 17.5                                                   |
| 1883 - - | 10                                                    | 3.8                                                    | 1890 - - | 0                                                     | 0                                                      |
| 1884 - - | 39                                                    | 1.5                                                    |          |                                                       |                                                        |
| 1885 - - | 54                                                    | 4.2                                                    | 1891 - - | 3                                                     | 0                                                      |
| 1886 - - | 46                                                    | 2.7                                                    | 1892 - - | 6                                                     | 0                                                      |
| 1887 - - | 49                                                    | 7.6                                                    | 1893 - - | 8                                                     | 0                                                      |
| 1888 - - | 42                                                    | 12.0                                                   | 1894 - - | 0                                                     | 0                                                      |

2, App. 278 ;  
and reports  
of Army  
Medical  
Department  
for the years  
1889-1894.



In order to maintain the same basis, the rates are stated as in the other tables in relation to every 10,000 of the strength, but except in the year 1886 the force in Egypt has never amounted to 10,000 men. It will be well, therefore, to give the actual figures, since a false impression as to the extent of the disease might otherwise be created. The actual figures are as follows :—

|  |  | Year.  | Strength. | Attacks of Small-pox<br>(actual number). | Deaths from Small-pox<br>(actual number). |
|--|--|--------|-----------|------------------------------------------|-------------------------------------------|
|  |  | 1882 - | 6,198     | 3                                        | 0                                         |
|  |  | 1883 - | 7,897     | 8                                        | 3                                         |
|  |  | 1884 - | 6,468     | 25                                       | 1                                         |
|  |  | 1885 - | 9,593     | 52                                       | 4                                         |
|  |  | 1886 - | 11,062    | 51                                       | 3                                         |
|  |  | 1887 - | 5,272     | 26                                       | 4                                         |
|  |  | 1888 - | 3,346     | 14                                       | 4                                         |
|  |  | 1889 - | 3,431     | 42                                       | 6                                         |
|  |  | 1890 - | 3,209     | 0                                        | 0                                         |
|  |  | 1891 - | 3,172     | 1                                        | 0                                         |
|  |  | 1892 - | 3,102     | 2                                        | 0                                         |
|  |  | 1893 - | 5,073     | 4                                        | 0                                         |
|  |  | 1894 - | 5,226     | 0                                        | 0                                         |

It will be seen that in the years 1887-89, and especially in the year 1888, the fatality was very high. We are not aware what is the explanation of this. It may be that small-pox prevailed in Egypt in a specially virulent form in those years.

There is a point connected with the returns of small-pox in the Army which must be borne in mind, not only in relation to the attacks of small-pox amongst the troops in Egypt, but with respect to the disease in the Army generally. It has been stated that the per-centage of unsuccessful re-vaccinations is often as high as 20 to 30 per cent. It is certain that soldiers are often disposed to withdraw if possible the vaccine matter, and thus to prevent vaccinia ensuing on the operation. Efforts are no doubt made to provide against this, but they are not likely to be always effectual. It may well have been the case, therefore, that a sensible per-centage of the men were not protected by successful re-vaccination.

337. The following table shows the attack-rate of, and mortality from, small-pox in the navy, wherever stationed, during each of the years 1860-1894 :—

| Year.  | Attacks of Small-pox<br>to every 10,000 of<br>the Force. | Deaths from Small-<br>pox to every 10,000<br>of the Force. | Year.  | Attacks of Small-pox<br>to every 10,000 of<br>the Force. | Deaths from Small-<br>pox to every 10,000<br>of the Force. |
|--------|----------------------------------------------------------|------------------------------------------------------------|--------|----------------------------------------------------------|------------------------------------------------------------|
| 1860 - | 51                                                       | 3·9                                                        | 1878 - | 2                                                        | 0                                                          |
| 1861 - | 50                                                       | 3·8                                                        | 1879 - | 12                                                       | 3·1                                                        |
| 1862 - | 17                                                       | 3·1                                                        | 1880 - | 2                                                        | ·2                                                         |
| 1863 - | 22                                                       | 2·8                                                        | 1881 - | 6                                                        | ·7                                                         |
| 1864 - | 87                                                       | 6·2                                                        | 1882 - | 2                                                        | ·5                                                         |
| 1865 - | 32                                                       | 2·9                                                        | 1883 - | 2                                                        | 0                                                          |
| 1866 - | 48                                                       | 1·6                                                        | 1884 - | 1                                                        | 0                                                          |
| 1867 - | 49                                                       | 2·7                                                        | 1885 - | 1                                                        | 0                                                          |
| 1868 - | 16                                                       | ·4                                                         | 1886 - | 2                                                        | ·6                                                         |
| 1869 - | 17                                                       | 1·0                                                        | 1887 - | ·2                                                       | 0                                                          |
| 1870 - | 9                                                        | ·2                                                         | 1888 - | 4                                                        | ·2                                                         |
|        |                                                          |                                                            | 1889 - | 1                                                        | ·2                                                         |
| 1871 - | 31                                                       | 2·5                                                        | 1890 - | 1                                                        | ·4                                                         |
| 1872 - | 19                                                       | 2·3                                                        |        |                                                          |                                                            |
| 1873 - | 3                                                        | ·2                                                         | 1891 - | 3                                                        | 0                                                          |
| 1874 - | 2                                                        | ·2                                                         | 1892 - | 2                                                        | ·3                                                         |
| 1875 - | 4                                                        | ·2                                                         | 1893 - | 1                                                        | 0                                                          |
| 1876 - | 5                                                        | 1·3                                                        | 1894 - | 3                                                        | 0                                                          |
| 1877 - | 4                                                        | 0                                                          |        |                                                          |                                                            |

338. Since April 1864 it has been the practice in the navy to vaccinate every person entering the service, other than natives joining abroad. Before that date, though medical officers had been required to advise the men under their care to be vaccinated, there was no regulation enforcing vaccination. During the latter part of



the year 1864 and during the following years, as men who had previously joined left the service, the proportion of the force who had been vaccinated since enlistment increased; until in March 1871, before this can have attained its maximum, an order was issued for the vaccination of the whole force, whether the men had been previously vaccinated or not and even in cases where they had had small-pox. For some time, however, after the issue of this order there existed no regulation enforcing the vaccination of "foreigners," natives engaged abroad and discharged before their ship returns from her station; but in 1873 an order was issued for their vaccination on enlistment. Since the year 1873 the force should, under the regulations, consist only of persons who had been vaccinated since enlistment.

Q. 2654:  
2659; 3220-  
32; 3243-4;  
3443.

Q. 2670;  
3172-3;  
3226-34.  
Q. 3226-34.

339. During the period 1860-1864 the death-rate from small-pox in the navy gave no evidence of decline. Speaking generally of the period 1864-1894, the growth of the proportion of the force who had been vaccinated since enlistment was accompanied by a decline in the death-rate from small-pox, and the lessened death-rate has on the whole continued during those later years of the period in which that proportion has presumably been maintained at its highest. In the year 1879 the death-rate was, indeed, higher than it had been in any year since 1864; but ten out of the fourteen deaths from small-pox which occurred during that year (representing 2·2 of the death-rate of 3·1 shown in the table in § 337) were those of certain "foreigners," shipped on one particular vessel, whom the medical officer of the ship had, contrary to the Admiralty regulations, neglected to vaccinate. The vessel referred to is the "Boadicea." When at Sierra Leone, 37 Kroomen were shipped on board her. Sixteen of them showed evidence of having had small-pox in their youth, and two had vaccine marks on their arms. Twelve Kroomen were attacked in all, of whom 10 died. None of them had suffered from small-pox previously, and only one, who had the discrete form and recovered, showed vaccine marks. Twenty-four white men were attacked, of whom one only died. Of the remainder, four suffered from the confluent form, eight from the discrete, six from the varicelloid variety, and five from fever without any eruption. With one exception, faintly marked, all the white men had good cicatrices, some of them being due to re-vaccination.

6, App. 688.

340. We have further evidence also with regard to the postal service. Sir Charles Dilke, speaking in June 1883, made the following statement about those employed in that service in London:—"In the case of persons permanently employed in the postal service in London, averaging 10,504, who are required to undergo vaccination on admission, unless it has been performed within seven years, there has not been a single death from small-pox between 1870 and 1880, which period included the small-pox epidemic, and there have been only 10 slight cases of the disease. In the telegraphic department where there is not so complete an enforcement of vaccination there have been only 12 cases in a staff averaging 1,500 men." When it is remembered how many of the persons so employed become subject in a degree exceeding that of the population at large to the risk of contagion, and that the period referred to included that of the epidemic in London of 1870-2, when there were so many attacks of and deaths from small-pox, the statement is certainly noteworthy.

We have not been able to obtain information bringing the statistics given above down to the present date. We have been furnished, however, with the following particulars:—

| Year. | General Post Office.                     |                               |                                  |
|-------|------------------------------------------|-------------------------------|----------------------------------|
|       | Number of established officers employed. | Number of cases of small-pox. | Number of deaths from small-pox. |
| 1891  | 47,264                                   | <i>None.</i>                  | <i>None.</i>                     |
| 1892  | 54,198                                   | 2                             | <i>None.</i>                     |
| 1893  | 58,311                                   | 4                             | <i>None.</i>                     |
| 1894  | 60,490                                   | 11                            | 1                                |

It is noteworthy that, in the year 1892, 12 officers were absent from duty on account of the presence of small-pox in their houses; in 1893, 44; and in 1894 as many as 53.

341. It should be mentioned that a study of the facts observed by the medical men who have investigated recent epidemics tends to the conclusion that the re-vaccina-



tion induced by the existence of an epidemic of small-pox has played no small part in checking the spread of the disease and narrowing its limits. It seems to have been a very important factor in controlling the epidemic.

342. Summing up, then, the evidence on the subject of re-vaccination so far as regards this country, we find that particular classes within the community amongst whom re-vaccination has prevailed to an exceptional degree have exhibited a position of quite exceptional advantage in relation to small-pox, although these classes have in many cases been subject to exceptional risk of contagion. We find, further, taking the evidence as a whole, that in the population at large re-vaccinated persons seem to be in a position much more advantageous not only than the unvaccinated, but than adults who have only been vaccinated in infancy.

There is another conclusion suggested by the evidence to which we ought to advert, for it is of importance. Where re-vaccinated persons were attacked by or died from small-pox, the re-vaccination had for the most part been performed a considerable number of years before the attack. There were very few cases where a short period only had elapsed between the re-vaccination and the attack of small-pox. This seems to show that it is of importance in the case of any persons specially exposed to the risk of contagion that they should be re-vaccinated, and that in the case even of those who have been twice vaccinated with success, if a long interval since the last operation has elapsed, the operation should be repeated for a third, and even for a fourth time.

343. A comparison has been instituted between the annual mortality from small-pox of males and females per million living at different ages for the three decennia between 1851-1880, and it has been suggested that an inference unfavourable to vaccination is to be drawn from this comparison, inasmuch as the mortality of males exceeds that of females, whilst the former were presumably the better vaccinated class. It is to be observed, however, that if the age below 15 be separately regarded, when infantile vaccination would be most protective, and when the conditions of exposure would probably be much the same, there is no substantial difference between the mortality of males and females. Above the age of 15, when the male population would be likely to be exposed to the risk of contagion more than the female, the deaths amongst the male population were considerably more than among the female. There is no reason to believe that this increased risk was counterbalanced to any material extent owing to a much larger proportion of the male population having been re-vaccinated than of the female. There is every reason to think that only a small proportion of either class had submitted to the operation of re-vaccination. The number of those who pass through the army is not large in proportion to the total population. And, on the other hand, the number of females employed as domestic servants, whose re-vaccination would be likely to be attended to, exceeds that of men so employed.

344. In discussing the effect of vaccination upon the fatality of small-pox, and the attack-rate and type of the disease, we have referred exclusively to materials derived from experience acquired in England. We have done so, because we possess the records of a careful examination into the circumstances of epidemics which occurred in that part of the United Kingdom. We have already insisted upon the importance of the reports which embody the results of those investigations. We do not possess any information of the same character with reference to the incidents of small-pox epidemics in other parts of the United Kingdom. We have not referred to the reports we received with regard to the other epidemics because they were of a more limited scope, and the information was derived more from other persons and less from a systematic investigation by the medical man appointed by ourselves. Nevertheless they contain much information with regard to the incidence of small-pox upon the vaccinated and unvaccinated which is in conformity with the results derived from the more complete investigation of the epidemics in the other towns. The records of the small-pox hospitals in London, which we have quoted, furnish the particulars of a very large number of cases. We have no similar records relating to anything like the same number of cases either in Scotland or Ireland. We have pointed out the superior value of statistical results, when derived from a large number of cases. For these reasons we do not propose to refer specifically to the evidence drawn from experience in Scotland or Ireland, bearing upon the question whether vaccination diminishes the fatality of small-pox or renders persons less liable to be attacked by, or to suffer severely from it. This much, however, we may say, that the evidence relating to those parts of the United Kingdom does not in any way tend to modify the conclusions to which a study of the evidence relating to England leads. On the contrary, its tendency is to confirm and strengthen them.



345. We have hitherto made no reference in this part of the case to what is to be learned by an inquiry into the practice of vaccination and the records of the disease of small-pox in foreign countries. We do not propose to include in our report an exhaustive examination of the experience gained in other countries than our own; it would obviously carry us beyond all reasonable limits of space. We may, however, refer to some important facts which have been prominently brought to our notice. *Small-pox and vaccination in foreign countries.*

346. It is worth noting, for example, that a change of the same nature as regards age incidence, which has distinguished the mortality from the disease in the present day from that prevailing in the last century, has been observed in Germany also. There are records of epidemics in that country during that century where the deaths were exclusively among those under 20 and almost exclusively among those under 10 years of age. 2, App. 232-3.

347. A comparison of the mode in which the very general small-pox epidemic of 1870-71 affected the German and French armies in those years is especially worthy of attention. In the year 1834, vaccination was made compulsory for soldiers in the Prussian army. Although it may not have been enforced with complete thoroughness, there seems to be no doubt that the German army was, on the whole, a well-vaccinated class at the time of the campaign of 1870-71. We do not think there can be any real doubt that the French army was, during the same period, in a condition in that respect less satisfactory. According to the official returns, the number of small-pox deaths in the German forces during the years in question was only 316. It was stated by Monsieur de Freycinet, when Minister of War, that 23,400 French soldiers died of small-pox during the years 1870-71. We have not been able clearly to ascertain how these last figures were procured. They were not derived directly from any official return. It would seem that the average derived from a limited number of returns relating to particular portions of the army was applied to the army as a whole. It is quite possible, therefore, that the figures given may not be accurate, and that the number stated is in excess of the real number of deaths; but we do not think it is possible to doubt that the ravages of small-pox in the French army were very great, and that the mortality was enormously in excess of that suffered by the force which was opposed to them. Various facts which have been deposed to, as for example, the small-pox deaths in the ranks of the French soldiers imprisoned in Germany, confirm this view, which receives further confirmation from a comparison of the small-pox deaths in the French and Prussian armies in the time of peace which immediately preceded the war. In 1869, there were 63 deaths from small-pox in the various French garrisons. In the four years from 1866 to 1869 there were 380 deaths from small-pox, 323 of them being in the active army. On the other hand, the total number of deaths from small-pox in the Prussian army from 1835 to 1869 was but 77. Q. 1496; 6, App. 728. 6, App. 727; Q. 1545-7. Q. 1543; 6, App. 728; 6, App. 727. 6, App. 725; Q. 1543-4; 2, App. 241.

348. Information of great importance is derived from an observation of the apparent effect of the law which was passed in Prussia in the year 1874 making re-vaccination compulsory. Since that period small-pox mortality in that country has been reduced to proportions quite insignificant as compared with any previous epoch. It is instructive in this connection to compare the deaths from small-pox per 100,000 of the population in Prussia and Austria. The deaths do not, of course, correspond year by year; sometimes they are higher in one country than in the other, and upon the whole the mortality shown is greater in the case of Austria than of Prussia, but in the period prior to 1874, there is no contrast to be found such as is observable since that year. The figures for 1874 and for some years prior and subsequent to that date are worth placing side by side.

| —    | Prussia. | Austria. | —    | Prussia. | Austria. |
|------|----------|----------|------|----------|----------|
| 1862 | 21·06    | 31·14    | 1872 | 262·37   | 189·93   |
| 1863 | 33·80    | 53·10    | 1873 | 35·65    | 323·36   |
| 1864 | 46·25    | 84·78    | 1874 | 9·52     | 178·19   |
| 1865 | 43·78    | 45·53    | 1875 | 3·60     | 57·73    |
| 1866 | 62·00    | 36·85    | 1876 | 3·14     | 39·28    |
| 1867 | 43·17    | 74·08    | 1877 | 0·34     | 53·18    |
| 1868 | 18·81    | 33·27    | 1878 | 0·71     | 60·59    |
| 1869 | 19·42    | 35·18    | 1879 | 1·26     | 50·83    |
| 1870 | 17·52    | 30·30    | 1880 | 2·60     | 64·31    |
| 1871 | 243·21   | 39·28    | 1881 | 3·62     | 82·67    |

6, App. 728.



349. In the year 1884 a Commission which had been appointed by the German Government to inquire into the subject of vaccination made their report, which, besides the comparison of Prussian and Austrian mortality just referred to, contains much valuable matter bearing upon the protective effect of vaccination.

350. Upon a review of all the information derived from other countries which we have had an opportunity of considering, it appears to us not to contradict, but, on the contrary, to confirm the experience acquired in this country. The same may be said, too, of the evidence which has been placed before us relating to India and the British Colonies.

351. Much criticism has been applied to the writings of Jenner, and of other early advocates of the practice of vaccination, and strenuous efforts have been made to show that their observations cannot always be relied on, and that their reasoning was at times unsound. This appears to us, even if it were established, to be of little importance as a guide to the conclusion which ought to be arrived at on the question whether vaccination affords any protection against small-pox. We have now in our possession the experience of more than half a century, during which facts relating to the effect of vaccination upon small-pox have been carefully recorded. If a study of this experience taught us that vaccination had not exercised any beneficial influence as a protection against small-pox, that the ravages of the disease were as great in the case of the vaccinated as of the un-vaccinated, and that no difference could be observed in the manner in which it treated the two classes, we could have no faith in vaccination as a prophylactic, however apparently accurate the observations of Jenner and his associates, or however apparently conclusive their reasoning. If, on the other hand, the reasonable conclusion, from an experience of more than half a century of the practice of vaccination, be that the vaccinated show less liability to attack by the disease of small-pox, or when attacked, suffer less fatally or severely, these facts cannot be displaced by showing that Jenner and his associates erred in some respects both in their observations and in the conclusions they founded upon them. It would, in our opinion, in that case, have been proved that however mistaken they may have been in other respects, they were right at least on this cardinal point, that the vaccinated enjoyed a position in relation to small-pox superior to that of unvaccinated persons. We think it would be as little reasonable to reject the conclusion to which the experience of vaccination led us, because Jenner and other early advocates of the practice made mistakes, as it would be to believe in its protective influence on account of the credit which seemed due to their judgment or observations, in spite of the lessons to the contrary taught by a lengthened experience of the practice. In saying this, we must not be supposed to admit that all the criticisms to which Jenner and his associates have been subjected are sound, or to give our adhesion to them; we have desired only to point out why it seems to us of comparatively little importance whether they be so or not, and to assign to them their true place among the considerations which ought to guide us in determining the question whether or no vaccination has a protective influence.

352. When an attack of disease secures immunity or protection against another attack of disease, the two attacks are, as a rule, attacks of the same disease. Some pathologists have, it is true, of late years been led to suppose that one disease may confer some degree of immunity or protection against another different disease; but instances of this are few, and, moreover, cannot be regarded as thoroughly established. The ordinary instances of immunity are so clearly those in which the attack, natural or artificial, which confers the immunity is of the same disease as that towards which immunity is conferred, that identity of disease has been considered as essential to the conferring of immunity. And it has been argued that it is *à priori* improbable that cow-pox should confer immunity from small-pox, seeing that the two are different diseases. Such a purely theoretical argument can have little weight against positive evidence of vaccination having actually conferred immunity. If this be definitely proved to be the fact, proof is thereby at the same time afforded that the theory is unsound, either because a particular disease may confer immunity against a different disease, or because small-pox and cow-pox are not different diseases. For the practical object with which alone we are concerned, it is not material that we should reach any conclusion upon the question what is the real source of error in the theory alluded to, supposing it to be erroneous? We shall content ourselves, therefore, with a very brief notice of the subject.



353. Jenner himself, in his first paper, advanced the view that the cow-pox and small-pox were identical with each other; and since his time numerous observers have attempted to prove the identity of the two diseases experimentally, namely, by giving rise to cow-pox in the cow through the inoculation of small-pox matter or by the introduction of contagion in other ways. It may at once be stated that while cow-pox is readily transferred from the cow to man and back again from man to the cow, the disease in man being identical with that in the cow, small-pox cannot be transferred from man to the cow so as to give rise to a disease in the latter identical in its features with the small-pox of man. Nor can cow-pox be so transferred to man as to give rise in him to small-pox. The two diseases are not in this sense convertible.

*As to the suggested identity of cow-pox and small-pox.*

354. In most cases the attempt to transfer small-pox from man to the cow \* has had simply a negative result; no obvious effect of any kind has been observed. This has been the case in the attempts to introduce the contagion through absorption by the respiratory or digestive organs, and in most of the attempts to introduce the contagion by inoculation. In certain instances these latter attempts have produced results which may be briefly described in three categories. (We may pass over the isolated experience of Thiele, who in 1838 asserted that by keeping small-pox matter sealed between glass plates for ten days before using it, and by diluting it with milk when using it for inoculation, the matter thus treated through ten removes through the human body (the cow not intervening at all) was converted into something which gave results identical with those of ordinary vaccine matter. We are not aware of any attempt to corroborate this experiment.)

355. The first category includes the experiments in which the inoculation of small-pox matter into the udder, or adjoining parts, of the cow gave rise at or near the seat of inoculation to a vesicle, either identical in visible characters with the ordinary vaccine vesicle produced by inoculation with the matter of cow-pox, or to a vesicle the features of which, while not corresponding wholly with those of a perfect vaccine vesicle, so closely resembled them as to justify the vesicle being called a vaccine vesicle. Further, the matter from a vesicle which at the first inoculation had not the characters of a perfect vaccine vesicle, when carried through a second or third remove in the cow, fully acquired those characters, and when transferred to man gave results indistinguishable from the ordinary vaccine vesicle. Indeed, lymph of such an origin has come into general use for vaccination purposes. Of the experiments, the best known or most quoted are those of Thiele (1838), Ceely (1840), Badcock (between 1840 and 1860), Voigt (1881), Haccius and Eternod (1890), King (1891), Simpson (1892), and Hime (1892); but there are several others. The details of the experiment are very scanty in the cases of Thiele and Badcock, but more full in the others, especially, perhaps, those of Ceely and Haccius.

6, App. 661-86; Q. 24,023 et seq.

356. In the second category may be placed the experiments of Klein and Copeman. Klein, who had in 1879 obtained in 31 trials what then appeared simply negative results, found in a renewed research in 1892 that the result of the first inoculation in the cow of small-pox matter was not a distinct vesicle but merely a thickening and redness of the wound. Lymph pressed from the thickened wound produced, when inoculated into a second cow, a like result, but rather more marked; the thickening and reddening still further increased with a third and a fourth cow. Lymph squeezed from the wounds of the fourth cow produced in a child typical vaccine, and crusts from the child produced typical vaccine in a cow. Copeman obtained somewhat similar results; the appearances increasing in three removes and approaching those of typical vaccine, but not reaching them.

Q. 26,940-27,061; 28,978-29,020, 29,037-42, 29,089-95.

357. The third category consists of the results obtained in an elaborate inquiry conducted by a Commission of the Society of Medical Sciences at Lyons, with Chauveau at its head. Those results, reported in 1865, were briefly as follows:—

Inoculation of the cow with small-pox matter in any one of the 30 animals used did not give rise to a vaccine vesicle. Nevertheless a definite result was obtained, in the form, however, not of a vesicle, but of a thickening and inflammation of the wound; when a puncture was employed this became a papule. Lymph squeezed from such a papule and inserted into a second animal gave rise to a like papule; and this, again,

\* Note.—“Cow” is here and in the following pages used, for brevity’s sake, for the species irrespective of age and sex.



might be used for a third animal, but often failed; and the effect could in no case be carried on through more than three or four removes.

When the inoculation was repeated on an animal in which a previous inoculation had produced such a papule, no distinct papule was formed, and, moreover, lymph squeezed from the seat of inoculation produced no effect at all when used for the subsequent inoculation of another animal. This shows that the development of the papule was the result of the specific action of the virus. The same is shown by the fact that no such papule was produced when the small-pox matter was inserted into an animal which had previously had cow-pox naturally or artificially, as well as by the fact that when an attempt was made to vaccinate, with vaccine matter of proved efficacy, an animal on which a papule had been so developed by inoculation with small-pox the vaccination failed, though the animal had never had natural cow-pox or had never been vaccinated. The specific nature of the lymph of the papule is further shown by the fact that such lymph when used on the human subject gave rise to veritable small-pox. It has been urged that in this case the virus producing the effect was simply the old virus used in the inoculation, producing the papule and still clinging to the wound. This is disproved by the experience that lymph from a papule of the second remove also gave rise in the human subject to veritable small-pox.

Thus Chauveau and his Commission found that small-pox implanted in the cow gave rise to a specific effect which was not cow-pox but was of the nature of small-pox, though its manifestations in the cow were different from those of small-pox in man. They also obtained similar results in attempting to transfer small-pox to the horse.

358. It must be admitted that the results finally obtained in some of the successful cases were indistinguishable from those of vaccination; the characters of the local vesicle, the absence of eruptive pustules and of contagiousness, show that the lymph thus apparently originating from small-pox in the hands of Ceely, Badcock, and others was vaccine lymph. It has been urged that a vaccine vesicle making its appearance in the wound of inoculation with small-pox was due to the accidental introduction of cow-pox matter into the wound; the small-pox matter in the wound produced no effect, and the cow-pox matter its usual effect. Several considerations support this view. The cow is peculiarly susceptible to cow-pox. In some cases (Ceely, Voigt), the animal was vaccinated as well as inoculated with small-pox; thus in Ceely's first case, the animal was inoculated with small-pox on one side of the body, and a few days after vaccinated on the other side. In many cases the experiments were conducted in an animal vaccine establishment, the stalls, the operating tables, and the assistants being those used or engaged in vaccination. It is true that in some cases at least special precautions, sterilisation of instruments and the like, were taken to avoid the accidental introduction of cow-pox; but in observations of this kind the difficulties of avoiding all such sources of error are notorious. Still the successful cases are now so numerous that it is difficult to resist the conclusion that the same accident could not have occurred in all, and that a transformation of small-pox into cow-pox—that is to say, into the artificially inoculated cow-pox which we call vaccine—really took place.

359. Accepting this view provisionally, it may be remarked that in most cases the transformation was sudden and complete; the small-pox virus, under the influence of the tissues of the cow, became immediately converted into vaccine virus, and this produced a typical vaccine vesicle. In some cases, *ex. gr.*, that of Hime, the transformed virus produced its effect not in the wound of inoculation, or not chiefly so, but at some little distance from it. In some cases the characters of the vesicle first formed, though sufficiently distinct to justify the vesicle being called a vaccine vesicle, were not those of a perfect vaccine vesicle, but the lymph from such a vesicle, at least after one or two removes, gave rise to most typical vaccine vesicles.

In Klein's experiments the transformation was gradual. In his fourth cow, the virus was as yet not typical vaccine, since it did not produce a typical vesicle; yet it was so far already vaccine that, transferred to the child, it produced typical vaccine (unless we suppose some accidental introduction of vaccine to have taken place). That the vesicle on the child was vaccine and not small-pox unaccompanied by eruptive pustules, was shown not only by its characters but also by the fact that lymph from it produced typical vaccine in the cow.

In Chauveau's experiments no transformation at all took place.

As has been urged in another place (discussion on Woodville's cases, pages 145-153),



there are no adequate reasons leading us to believe that in the human subject the small-pox virus and the cow-pox virus can so act on each other as to form a hybrid disease. But this does not preclude the view that, accepting the conclusion that the body of the cow has the power to convert small-pox into vaccine, the virus may exist for a while in a phase in which, while ceasing to be typical small-pox, it has not yet fully acquired the characters of vaccine, and we may regard Klein's results as illustrating this. In some of the experiments—for instance, those of Ceely and Voigt—the results obtained with the lymph of the vesicle produced by the inoculation of small-pox give rise to the suspicion that the lymph had small-pox qualities, as seen, for example, in the case of Ceely's assistant, Taylor; but the facts cannot be said to be more than suspicious, they are not decisive. Moreover, admitting that the vesicle itself in such cases was the result of the transformed virus, some not transformed old virus might still remain dormant in the wound, and might be present in the lymph of the vesicle, mixed with the transformed and generating virus; this old virus might have happened to be in excess on the point of the lancet which wounded Taylor.

360. Taking all the various facts into consideration, we seem led to the provisional conclusion that under certain conditions the tissues of the cow are able to transform small-pox into vaccine, that these conditions may be such as to lead to the transformation being sudden and complete, that under certain other conditions the transformation may be gradual and incomplete, and that under certain other conditions, and these seem most commonly to obtain, the transformation into vaccine does not take place at all. But what the above conditions are has not as yet been clearly made out. It has been suggested that one condition favourable to the transformation is extreme youth of the subject; to effect the change the animal used should be a calf of not more than 3 or 4 months old, but this is not definitely proved.

Until these favourable conditions have been clearly recognised, so that, the conditions being fulfilled, the transformation will always be secured, the conclusion cannot be regarded as indisputable. Moreover, it must be borne in mind that effects more or less closely resembling a vaccine vesicle have been at various times obtained by various observers through inoculating man or the cow or another animal with material other than that obtained from the pustules of the small-pox of man. Much discussion has taken place concerning the "grease" of the horse, which Jenner believed to be the origin of the cow-pox of the cow. Without entering into any discussion of the matter, it may be said that investigation has shown that horses do suffer from a malady which, transferred to the cow, gives rise to a vaccine identical apparently with that produced by the inoculation of the natural cow-pox. Hence this malady is spoken of as the "horse-pox," and some cases at least of so-called "grease" appear to be cases of this horse-pox. But it is at least not proved that all the cases of "grease" which by inoculation were found to give rise to vaccine vesicles in man, were cases of true horse-pox. And this at least must be said, that no investigations as complete and varied as those which have been carried out with regard to the development of vaccine vesicles through the inoculation of small-pox matter, have been carried out with regard to the alleged development of vaccine vesicles by the inoculation of other material, such as the matter from the eruptions of the sheep-pox, the cattle plague, and the like. Nor have there been like extended inquiries as to the production of vesicles resembling those of vaccine by the inoculation of small-pox matter into animals other than the cow or the horse; such results as have been obtained by observers are conflicting. There is still room for much inquiry, meanwhile it may be said that, in any case, the evidence in favour of a possible transformation of small-pox into vaccine is sufficiently strong to remove the force of the theoretical objection to the power of vaccination to secure immunity towards small-pox, on the ground that the two diseases are absolutely distinct.

361. It may be well to advert to the fact that the protective effect, in relation to small-pox, of the much milder disease of cow-pox, is not an isolated phenomenon. It has been illustrated of late years in the investigations of Pasteur and others, showing in other communicable diseases of animals the means of so mitigating the virus, whether by transmission from one species to another or by various methods of cultivating or attenuating it, that a very slight disease produced by the milder form is yet protective against the more severe.

362. It appears to us that we may dismiss for practical purposes the theoretical questions which were discussed before us so fully. If the fact be established that the



introduction of vaccine matter and the consequent vaccinia produce some effect upon the human body which renders it less susceptible to small-pox, or which modifies that disease when the small-pox virus enters the system, it will not be a strange or unwonted experience that we should be unable to explain how this comes about. Science has not yet succeeded in freeing therapeutics or kindred subjects from obscurity, or in solving all the problems which they present. The precise *modus operandi* by which a previous attack of a disease furnishes security against a subsequent attack by the same disease, has not yet been elucidated. There can be no cause for astonishment, then, if we are unable to trace the steps by which vaccination exerts a protective influence, supposing the fact that it does so be established, nor is it essential that we should succeed in tracing them. Our inability to accomplish this does not seem to us to be the slightest reason for regarding with doubt the conclusions to which the facts lead us.

363. Professor Crookshank, than whom no one has more strongly insisted on the theoretical arguments against the protective influence of vaccination in relation to small-pox, gives it as his opinion that vaccination creates a transient antagonism to that disease. We understand his view to be that an attack of disease can only afford protection against the same disease, and that small-pox and cow-pox are not the same but different diseases. We gather, however, that in his opinion so long as the state of antagonism lasts, the person in whose system it exists is less likely to suffer from small-pox than he would be if the state of antagonism were wanting. This seems to us to amount in effect to the same thing as saying that during that period vaccination has conferred some protection. Whether the effect be to create antagonism or to confer protection, and whatever difference there be between the *modus operandi* in the one case and in the other, we know equally little about it. If a condition of transient antagonism to small-pox is induced by vaccination, theoretical considerations will not afford a guide of the slightest value to the conclusion how long this transient antagonism will last, or how soon it will pass away. Experience, and experience alone, can answer that question. *A priori* we do not see that there is any better reason for supposing that it would last for two or three years than that its duration would extend to 10 years.

364. If an impartial study of the facts led to the conclusion that small-pox treats the vaccinated and unvaccinated alike, this would throw, no doubt, an interesting light on the theories which have been advanced. If it leads to the contrary conclusion, then any theory inconsistent with it, especially any theory based upon hypotheses drawn from those obscure regions which science has not yet completely illuminated, may safely and wisely be disregarded.

Summary of  
evidence as  
to whether  
vaccination  
has any, and  
if so what,  
protective  
influence in  
relation to  
small-pox.

365. We proceed then to sum up the evidence bearing upon the question whether vaccination has any, and if so what, protective influence in relation to small-pox, and to state the conclusions at which we have arrived.

366. We find that the period which immediately followed the introduction of the practice of vaccination was characterised in all countries in which the practice prevailed by a marked though irregular diminution of small-pox mortality, and that this diminution of mortality, when compared with the century preceding vaccination, has continued in those countries down to the present time. We think this statement of the case is accurate, notwithstanding that the present century has witnessed epidemics of considerable severity even in countries where vaccination has largely prevailed. There has always been in those countries a class, more or less numerous, of unvaccinated persons who would, of course, be no less subject to the disease than if their neighbours, like themselves, had remained unvaccinated. Moreover, if it be true that experience has taught that the protective effect of vaccination diminishes in force, or for some purposes may even disappear, after the lapse of, say, 10 years from the date of the operation, there will be many of the vaccinated class liable to be attacked, and to suffer more or less from the disease, even conceding the protective effect of vaccination. We cannot think, therefore, that the fact that epidemics have from time to time occurred, and that deaths from small-pox continue, ought reasonably to be accepted as a proof that small-pox is uninfluenced by vaccination. In referring to the experience of the period which followed the introduction of vaccination, we are of course speaking generally. We have already considered the extent to which causes other than vaccination may have contributed to the diminished mortality from small-pox.



367. We observe next that there has been in the United Kingdom a remarkable change in the age-incidence of small-pox. The change does not appear to have been confined to this country, but we limit our remarks to it, because we have not as precise information on the point in the case of other countries. This change in the age-incidence appears, on the whole, to have become increasingly marked as the infantile population came to be more completely vaccinated. On the other hand, we have seen that where vaccination has been neglected or practically abandoned, a small-pox epidemic has been characterised by a very large mortality among children, when compared with the mortality exhibited in a well-vaccinated place visited by an epidemic of the same disease. This affords support to the view that vaccination is of protective value against a fatal result in the case of persons attacked by small-pox, and that its protective power is greatest during the early years after vaccination has been performed. We are unable to see that any satisfactory explanation has been given of the phenomenon now under consideration except that just indicated. We are indeed quite unable to appreciate the bearing of some of the circumstances which have been put forward as explaining it. As to others, such as improved sanitation, we have already pointed out that they do not really afford any explanation of the phenomenon when viewed, as it must be, in connection with the age-incidence and mortality found to prevail in the case of other diseases.

368. There is further strong evidence that where attacks of small-pox occur the fatality is far less in the case of the vaccinated than of the unvaccinated, and that this difference is much more marked in the first 10 years of life than at a later period. We have given full effect to all the considerations which have been urged with the view of showing that the division into vaccinated and unvaccinated cannot be relied on as accurate. We quite admit that absolute accuracy may not have been obtained in any of the instances in which this discrimination has taken place, but looking at the matter fairly as a whole, we cannot but believe that the division may for all practical purposes be regarded as substantially accurate. Indeed for the most part, it would seem to err, if at all, in representing the vaccinated class as comparing less favourably than it really ought with the unvaccinated, for all cases of doubtful or alleged vaccination have been included in the vaccinated class, and whatever errors there may have been in erroneously placing vaccinated cases in the unvaccinated class, we think that they are counterbalanced by errors in the opposite direction. We think the improbability extreme, indeed it seems to us to reach the point of incredibility, that the fatality in classes of persons discriminated on different occasions by so many different observers, only on the ground that vaccination was believed to be present in the one and absent in the other, should always show so very wide a divergence, unless there were some real difference in the liability to a fatal attack of those included in the one class as compared with those comprised in the other.

We can see nothing to differentiate them in this respect save that the one class possessed, while the other did not, the protection of vaccination, unless it be the circumstance suggested that the unvaccinated were drawn from a more neglected, and therefore from a less robust, portion of the population. We have already given our reasons for thinking this explanation quite insufficient to account for the phenomenon.

369. We notice further that the same classes of vaccinated and unvaccinated persons, which display when attacked by small-pox so marked a contrast in the fatality of the disease, manifest a contrast no less marked in the type of the disease from which they suffer, viewed in relation to its severity or mildness. Here again, unless vaccination be regarded as the determining cause of the difference, it would remain to us, after considering all the explanations which have been vouchsafed, an unsolved mystery.

370. The next point forced on our attention is the greater liability to attack which the evidence shows to exist in the case of the unvaccinated than of the vaccinated. We are of course again confronted by the possibility of error in the classification, but the same test was applied in dividing into the two classes those who inhabited the invaded houses as in making a similar division in the case of the individuals attacked. It is possible, too, that the inhabitants of the invaded houses included in the two classes were not all equally within the reach of contagion, but any error in this respect is just as likely to have affected the vaccinated as the unvaccinated class. When the numbers dealt with are considered, and it is remembered that the classification was made in different



towns and always with the same result, we do not think this source of possible error can be regarded as serious.

371. When we find again that, both as regards the type of the disease and the attack rate, the contrast is specially noticeable in those under 10 years of age, and that the explanations proposed are even less deserving of weight when applied to these phenomena than when regarded as a reason for the difference in the fatality of the disease in the two classes, the conclusion that vaccination exercises an influence in relation to small-pox, specially potent during the early years after the operation, to which, as we have already indicated, other considerations point, receives strong confirmation.

372. We see no reason for hesitating to adopt the conclusions to which we should otherwise be led, or to doubt the accuracy of the facts to which we have been adverting, on account of the objection, even if it be well founded in fact, that the fatality among the unvaccinated at the present day exceeds that experienced before the era of vaccination. We have already pointed out that in the statistics of modern times, with which we have been dealing, the fatality among the unvaccinated varied greatly, and it is by no means established that there were not as great variations in the pre-vaccination days.

373. It has been suggested that a comparison in the case of certain towns for the years 1892-93, of the attack-rate and mortality from small-pox, with the average annual default of vaccination for the previous 10 years, shows that there is no connexion between the amount of vaccination and the attack-rate of or mortality from small-pox. It is a sufficient comment upon this to point out that Gloucester stands very high in that comparison as a place where there had been much default of vaccination and very little small-pox.

374. We have still to notice two other groups of facts bearing upon the question. We have shown that there is evidence that where vaccination has been most thorough the protection appears to have been greatest. It may be that on this point the force of the evidence is less than on some of those just alluded to; nevertheless it cannot be left out of sight, or regarded as of no importance, when we are seeking an answer to the question whether vaccination has a protective influence, or is altogether ineffectual.

375. The fact that the revaccination of adults appears to place them in so favourable a condition, as compared with the unvaccinated,—and that, too, even when they are subjected to specially grave risk of contagion, and we take this to be established as a fact—affords further confirmation of the conclusions suggested by the evidence which we have already passed under review.

376. We have hitherto, save for a cursory reference to the bearing of some of the facts upon one another, treated the various tests which have been applied to ascertain whether vaccination has a protective effect separately and independently. We have found that in each case the result of the test has been to suggest an affirmative answer to the question. In order to estimate the value of the evidence aright, it is necessary to consider in conjunction all the tests which have been adopted, and the results which they exhibit. They are, it is true, independent of one another, and have been separately applied in a number of cases. But the greater the number of tests employed, and the greater the number of cases to which they are applied, the more certain is it that the play of chance, or the influence of other causes, will be excluded, and the more safely may the conclusions to which they lead be acted upon. The cumulative force of a number of independent pieces of evidence, all pointing in the same direction, is very great indeed. Even if a more or less plausible answer could be suggested in the case of each one of them standing alone, the cumulative force of the testimony might still be irresistible. We think those who have denied the efficacy of vaccination have often lost sight of the circumstance that investigations, which have followed so many different roads, have all led to the same end.

377. We have not disregarded the arguments adduced for the purpose of showing that a belief in vaccination is unsupported by a just view of the facts. We have endeavoured to give full weight to them. Having done so, it has appeared to us impossible to resist the conclusion that vaccination has a protective effect in relation to small-pox.

*Conclusion  
on this  
point.*



We think :—

1. That it diminishes the liability to be attacked by the disease.
2. That it modifies the character of the disease, and renders it (a) less fatal, and (b) of a milder or less severe type.
3. That the protection it affords against attacks of the disease is greatest during the years immediately succeeding the operation of vaccination. It is impossible to fix with precision the length of this period of highest protection. Though not in all cases the same, if a period is to be fixed, it might, we think, fairly be said to cover in general a period of nine or ten years.
4. That after the lapse of the period of highest protective potency, the efficacy of vaccination to protect against attack rapidly diminishes, but that it is still considerable in the next quinquennium, and possibly never altogether ceases.
5. That its power to modify the character of the disease is also greatest in the period in which its power to protect from attack is greatest, but that its power thus to modify the disease does not diminish as rapidly as its protective influence against attacks, and its efficacy during the later periods of life to modify the disease is still very considerable.
6. That re-vaccination restores the protection which lapse of time has diminished, but the evidence shows that this protection again diminishes, and that, to ensure the highest degree of protection which vaccination can give, the operation should be at intervals repeated.
7. That the beneficial effects of vaccination are most experienced by those in whose case it has been most thorough. We think it may fairly be concluded that where the vaccine matter is inserted in three or four places, it is more effectual than when introduced into one or two places only—and that if the vaccination marks are of an area of half a square inch, they indicate a better state of protection than if their area be at all considerably below this.

(B.) *As to the objections made to vaccination on the ground of injurious effects alleged to result therefrom; and the nature and extent of any injurious effects which do, in fact, so result.*

378. We proceed to address ourselves now to another subject submitted to us, viz.: “the objections made to vaccination on the ground of injurious effects alleged to result therefrom; and the nature and extent of any injurious effects which do, in fact, so result.”

379. This is obviously a matter of great importance. Not only has the utility of vaccination been denied, but it has been asserted that mischievous effects have been due to it, resulting in personal injury and in the loss of life. If the practice has been productive of substantial benefit in limiting the ravages of small-pox, and mitigating the severity of the disease, the fact that vaccination may lead in certain cases to personal injury or death, would of course not be a conclusive argument against its use. Danger of personal injury, and even of death, attends many of the most common incidents of life, but experience has shown the risk to be so small that it is every day disregarded. A railway journey or a walk in the streets of any large town certainly involves such risks, but they are not deemed serious enough to induce anyone to refrain from that mode of travelling or from frequenting the public streets. And to come within the region of therapeutics, it cannot be denied that a risk attaches in every case where chloroform is administered; it is nevertheless constantly resorted to, where the only object is to escape temporary pain. The admission, therefore, that some risk attaches to the operation of vaccination, an admission which must without hesitation be made, does not necessarily afford an argument of any cogency against the practice, if its consequences be on the whole beneficial and important, the risk may be so small that it is reasonable to disregard it. Everything depends, then, upon the extent and character of the risk.

380. Those who have assailed vaccination on the ground of the evil consequences which are said to flow from it, have adopted two lines of attack. They have asserted that evidence of its mischievous influence is to be traced in an increase in the number of deaths from certain specified diseases, corresponding with a spread of the practice



of vaccination, of which increase vaccination was, they alleged, really the cause. They have further insisted that evidence of the evil effects it produces is furnished by an examination of particular cases in which it has been found that injury or death has resulted from the operation.

381. We shall examine in the first place the contention that the records of mortality show an increase in the deaths from certain diseases during periods of extensive vaccination when compared with those when the practice was less in use, and that it may be fairly inferred, from this comparison, that vaccination was the cause of that increase.

382. It is to be observed that the diseases selected for such a comparison by the opponents of vaccination have not always been the same. In 1877, a return was obtained by an Order of the House of Commons, showing the deaths from 14 diseases at three periods, viz., 1847-1853, 1864-1867, 1868 to 1875; these periods having been regarded as distinguished from one another by a progressive advance in the number of vaccinated persons, especially children. The diseases were, *tabes mesenterica*, diarrhoea, bronchitis, pyæmia, skin disease, syphilis, convulsions, cholera, diphtheria, pneumonia, atrophy and debility, whooping cough, erysipelas, scrofula.

383. The first six of these diseases showed an increasing, the next four a decreasing, mortality, whilst the remaining four exhibited an irregular mortality, there being in three cases an increase in the second period, and a decrease in the third, and in another case a decrease in the second, but a slight increase in the third, when, however, the mortality was not so high as in the first period. When all the diseases were taken together, there appeared to be in the aggregate an increasing mortality. Some found in this circumstance evidence of the malign influence of vaccination. Such a conclusion is manifestly untenable. There was no more reason for attributing to vaccination the increase of mortality in the case of those diseases where the mortality had grown, than there was for asserting that to its beneficent influence was due the decrease of mortality in those cases in which the mortality had become less. The hypothesis that it caused the mortality in some instances to grow, and in other instances to decrease, and that it was responsible for the balance of increase shown on an aggregation of the two, does not merit serious attention. It is not as if all the diseases in the class showing an increasing mortality were such as could be deemed capable of being affected by vaccination, whilst those included in the class with a decreasing mortality were in a different category. Two of the diseases included in this latter class, viz., convulsions and pneumonia, have been regarded in particular cases, even on recent occasions, as having had their origin in vaccination.

Q. 27,187.

6, App. 646.

384. Dr. Ogle, in statistics drawn from the Reports of the Registrar-General for England and Wales, points out that the line of reasoning which had been considered by some sufficient to show that vaccination has produced in those who have been subjected to it, serious diseases, would equally serve to show that it has rendered them largely exempt from other diseases no less serious. He gives, as an example, the mortality from phthisis, pneumonia, convulsions, and from causes not ascertained or stated too vaguely for classification, and shows that, in each case, there has been a large decrease of mortality during the period from 1874 to 1891. He does not, of course, suggest that vaccination has been the cause of this decrease, but he asks, and we think the question a pertinent one, why it should be credited with the increase of diseases which have increased, and not equally be credited with the decrease where the mortality has diminished.

6, App. 645.

385. We will refer now specifically to the principal diseases, an increase in the mortality from which is at the present day charged against vaccination. Before doing so, it will be well to enquire whether infant mortality has shown an increase during the period into which we are enquiring. Vaccination is, in the vast majority of cases co-incident in point of time with this stage of life. If, then, it is the parent of other diseases, and has substantially augmented the number of deaths due to them, we should expect to see some effect produced on infant mortality as a whole, yet it is clear that the mortality of infants in the first year of life, as measured by the proportion of their deaths to births, has not increased at all during the times when infant vaccination has been increasing. The figures show that from 1838 to 1842 the annual infantile death-rate to one thousand births was 152; from 1847 to 1850 it was 154; in the



next decennium, 1851 to 1860, it was again 154; in the next decennium, 1861 to 1870, it was 154 for the third time. From 1871 to 1880 it fell to 149, and from 1881 to 1890 it further fell to 142. Q. 27,187.

386. Turning now to specific diseases, we will begin with syphilis. We shall confine ourselves for the present as regards this and other diseases exclusively to the question whether there is evidence that according as vaccination has more extensively prevailed the mortality from them has been greater and whether where such an increase is established there is evidence to justify its being attributed to vaccination.

387. It is the fact that deaths from syphilis have increased in the last 20 years among infants under one year of age. But the records of the mortality from the disease show that it is most largely fatal in the first three months of life. Such statistics as we have on the point indicate, too, that in England and Wales the increase has been greatest in that portion of the first year of life which would be practically unaffected by vaccination. There is certainly not the slightest sign of a cause operating, in the later portion of that age period, to increase the mortality from syphilis, which is absent in the first three months of it.

It may, indeed, be suggested that as three months is the age of compulsory vaccination in England and Wales that age period rather than a later one would exhibit the effect of syphilis resulting from vaccination. There is, however, no doubt that the number of vaccinations taking place much before the age of three months is small; and if syphilis or any other disease supervened upon it, there would be an interval between the vaccination and the death caused by that disease. The matter is, we think, put beyond doubt by an examination of the particulars of the 205 App. IX. cases in which deaths occurring between the 1st November 1888 and the 30th November 1891 were attributed to, or said to be connected with, vaccination, and which were investigated by the Local Government Board. In the case of 158 of these deaths the age exceeded three months, in the majority it was over four months. Only 20 were recorded as below the age of three months. In the remaining cases the age was not stated.

388. When we apply ourselves to the case of Scotland the supposed influence of vaccination in generating syphilis has to be tested in a somewhat different manner. The age of compulsory vaccination is there six months instead of three, so that a comparison has to be made between the mortality from syphilis in the first half and in the second half of the first year of life. There is nothing in such a comparison to lead to the belief that vaccination has increased the prevalence of syphilis. Taking the period of 1855-1863, immediately preceding that of compulsory vaccination, the proportion of deaths from syphilis in every 1,000 deaths in Scotland from that disease was at the age 0-6 months, 575. In the period 1864-1875 the corresponding proportion was 612. 6, App. 641. and in the period 1875-1887 it was 647. In the same periods the similar proportions of deaths at the age 6-12 months were 109, 118, and 109 respectively. It will be seen that while the proportion of deaths at the age 0-6 months had considerably increased between the periods 1853-1863 and 1876-1887 the proportion at the age 6-12 months had remained stationary. The proportionate increase in the number of deaths between the two periods was also greater in the case of the former than in the case of the latter age period.

The observation we have just made with regard to England, that deaths due to an illness produced by and supervening on vaccination would chiefly show themselves in the age period succeeding the time fixed for compulsory vaccination, applies equally to Scotland.

389. A statistical statement which has been placed before us shows that the number of deaths of infants from syphilis, in Ireland, has largely diminished during recent years. During the two years 1864 and 1865 it averaged 124, while during the two years 1887 and 1888 (the last for which we have the particulars) the average was only 40. Without suggesting any explanation of this remarkable reduction, it certainly affords strong proof that in Ireland vaccination has not been influential in increasing the prevalence of the disease in question. 2, App. 275.

390. Further evidence on the same point, of great importance, is afforded by a consideration of the statistics showing the deaths from syphilis under one year of age per



6, App. 646. million births in Leicester on the one hand and in England and Wales on the other. The Registrar-General has supplied us with the means of comparing the deaths in the period 1863–1867 with those in the period 1883–1887. We have already seen that the latter years were marked by a great decrease in the practice of vaccination amounting at last to a practical disuse of it. If vaccination were, to any serious extent, a cause of syphilis we should have expected to see some evidence of it in these comparative records of the mortality of infants under one year of age. Yet we find that whereas in England and Wales there was as between the former period and the latter an increase in the infant mortality from syphilis in England and Wales of 24·7 per cent. only, the increase between the same periods in Leicester was no less than 69·3 per cent. This does not, of course, imply any connection between the disuse of vaccination and the increase of infantile syphilis. It does, however, conclusively rebut the argument of those who seek to connect the increase of mortality from syphilis with the practice of vaccination.

It has been observed that the comparison is made between Leicester, which is an urban population, and the whole of England and Wales, which would comprise a large rural population. This is no doubt true, but it is true for both periods alike. It does not appear to us materially to vitiate the comparison for the purpose of disproving the allegation that the great increase of syphilis during the last 20 years is due to vaccination.

Even if it can be shown that in some instances syphilis has been inoculated by vaccination, the conclusion would still remain that this cannot have been so to any substantial extent.

391. We take next cancer. There can be no doubt that the mortality from cancer shown by the registered causes of deaths has considerably increased in recent years. This disease is, it must be remembered, one to which persons of advanced years are specially subject. The young are seldom its victims. And the increase of mortality from it has, for the most part, affected adults and principally old people. There has been an actual decrease in the mortality from the disease of those under five years of age. In the second and third quinquennials of life there has also been a decrease—it is only in later age periods that the mortality begins to rise, and the rise becomes more and more pronounced as the age increases. The increase is, therefore, greatest in the age period furthest removed from the time of vaccination, whilst in the age period nearest to it there is an actual decrease. This of itself would seem enough to acquit vaccination of the charge of having caused an increased mortality from cancer, even if the origin of that increase remained in complete obscurity. This, however, is not the case. The Registrar-General points out that there can be very little doubt that the increase is to a considerable extent apparent only, and is simply due to improved diagnosis, and more careful statement of the cause of death on the part of medical men. He calls attention in connection with this to the fact, that year by year the number of deaths ascribed to tumours, abdominal disease, or other similar imperfectly stated causes, has been undergoing diminution. This explanation of the increase of mortality shown by the registered causes of deaths receives support from the fact that the increase of mortality from cancer has been much greater among males than females, the rate for males having risen 62 per cent. in 20 years, while the rate for females rose only 43 per cent. As the Registrar-General observes : “The cancerous affections of males “ are in much larger proportion internal, or inaccessible, than are those of females, and “ consequently are more difficult of recognition, so that any improvement in medical “ diagnosis would add more to the male than the female reckoning.” It may be that, in addition to the apparent increase there has been some real increase in the mortality from cancer, but there is not a shadow of evidence to connect this with the practice of vaccination, whilst there is, as we have shown, evidence pointing the other way.

392. It is clear that whatever diminishes mortality in early periods, and favours the survival to middle age and beyond it, must necessarily tend to increase both the actual and relative mortality from any disease, such as cancer, which is a disease almost exclusively of middle and senile periods of life. It was to be expected, therefore, that vaccination, in conjunction with improved isolation methods and other precautions, having reduced the deaths from small-pox in the earlier periods of life, and the general mortality being less, there would be some increase in the number of deaths from cancer.



393. Next in order let us consider the case of erysipelas.

This is a disease largely affecting children, and, as Dr. Ogle showed in his evidence, chiefly in the first three months of life, *i.e.*, before the time when, as a rule, a disease supervening on vaccination would end in death. The annual death rates of infants from this disease, taken over a long series of years, per million living at each age period was, under three months, 1,905; aged three months but under six months, 774; six months but under one year, 268. He also drew attention to the fact that the mortality from erysipelas rose and fell in correspondence with the mortality from puerperal fever, which suggested an explanation of some part at least of the large mortality under the age of three months. Q. 27,210-27. 6, App. 647. Q. 27,222.

394. The last parliamentary returns, obtained with a view of ascertaining the relation of vaccination to certain diseases, do not afford any evidence of an increase in the mortality from erysipelas. They show on the whole a diminishing mortality from that disease among the infant population.

An examination of the per-centage during the first and second six months of life of the total mortality from erysipelas during the years 1855 to 1863, as compared with the years 1864 to 1887, has been obtained from the Registrar-General for Scotland. In that part of the United Kingdom vaccination seldom takes place much before the age of six months. The period first selected is that preceding the Act making vaccination compulsory in Scotland. An examination of this return certainly does not lend any countenance to the view that vaccination exercises a serious influence on the mortality from erysipelas. In the earlier period the per-centage of deaths within the first six months to the total deaths was 28·36; in the second period it was 28·88. In the earlier period the similar per-centage relating to the second six months of life was 5·02; in the later period it was 5·35. The changes it will be seen are very slight. There is certainly nothing to show that a new cause for gravely increased mortality had come into existence during the later period. It is worth turning again to the Leicester statistics. Comparing the years 1883 to 1887 with the years 1863 to 1867 we find that whereas in England and Wales there had been a decrease in the 20 years of 16·7 per cent. in the infant mortality from erysipelas, there had been at Leicester an increase of 41·5 per cent. As before observed, the comparison is made between Leicester and the whole of England and Wales, but this does not appear to us materially to vitiate the comparison for the purpose of disproving the allegation that there has been a substantial increase in mortality from erysipelas due to vaccination. 6, App. 641. 6, App. 646.

395. It may well be that in some cases vaccinated children have suffered fatally from erysipelas who, but for the operation of vaccination, would not have been attacked by the disease. This is a point we shall have to consider presently. But the evidence is, in our opinion, conclusive to show that there has not been during the last 40 years any material increase of deaths from erysipelas owing to vaccination.

396. Passing on to *tabes mesenterica* and *scrofula*, we find that the mortality from these diseases, as returned to the Registrar-General, shows an increase during the last 40 years. On the other hand, the mortality from allied diseases, such as hydrocephalus and phthisis shows a decrease. Some part, and it is impossible to say how much, of this increased mortality in the case of the two first-named diseases, and of the decrease in the two last named, is apparent only and not real, and results no doubt from better diagnosis leading to a transfer of cases from one class to another. On this point again it is useful to resort to the experience of Leicester. The increase of deaths under one year from *tabes mesenterica* and *scrofula* per million births in Leicester during the years 1883-87, as compared with the years 1863-67, was 25·8 per cent. A similar comparison for England and Wales shows a per-centage of 26·8 per cent. 6, App. 646.

We do not find any facts to warrant the assertion that the increased mortality from *tabes mesenterica* and *scrofula*, or any part of it, was due to vaccination.

397. Without encumbering our report with the details relating to pyæmia, bronchitis, diarrhœa, and skin diseases, which are all said to have increased owing to the mischievous influence of vaccination, we may confidently say that there is no evidence to justify the statement. It is, however, worth while pointing out that comparing, as before, the period of 1883-87 with the period of 1863-67, the increase of deaths under one year of age from diarrhœa and dysentery in Leicester was 4·2 per cent., whereas in England and Wales it was 0·5 per cent. A similar comparison in 6, App. 646.



respect of bronchitis shows the increase in Leicester to be 112·8 per cent., in England and Wales 73·3 per cent. It seems clear that as regards general infantile mortality Leicester has not gained by its avoidance of vaccination. Whilst in England and Wales the mortality of children under one year of age had between the periods selected for comparison decreased 7·5 per cent., in Leicester the decrease was only 2·8 per cent.

398. Upon the whole, then, we think that the evidence is overwhelming to show that, in the case of some of the diseases referred to, vaccination cannot have produced any effect upon the mortality from them, and that it has not in the case of any one of them increased the mortality to a substantial, we might even say an appreciable, extent.

399. When we pass to a consideration of the evidence that personal injury or death has resulted from vaccination, the questions which present themselves do not admit of the same simple solution as those with which we have just been dealing. The cause of death, or the nature of an illness, is sometimes obscure, and even if its nature be known, it may be difficult to ascertain with certainty what has been its origin. We shall have to make further reference presently to the difficulties which must needs be encountered in the investigation upon which we are engaged. As we have already stated, it is not open to doubt that there have been cases in which injury and death have resulted from vaccination.

400. In the years 1859–67 the deaths returned as due to erysipelas after vaccination varied from 2 to 13; the annual average being 6·8. From 1868–71 inclusive they varied from 9 to 24; the annual average being 18·0. From 1859–71 the population of England and Wales had increased from 19 to 22 millions. In addition to this there can be no doubt that the number of children vaccinated increased very much between 1868 and 1871, as compared with the previous period, owing to the legislation of 1867. Of course the greater the number of the vaccinated amongst the children born in any given period the greater, *ceteris paribus*, would be the number of cases of erysipelas after vaccination, without any necessary connexion between the two. The same remark applies to the period between 1872 and 1880, when the cases returned as erysipelas after vaccination varied from 16 to 39; the annual average being 28·5. The Act of 1871 undoubtedly increased largely the number of infantile vaccinations in this period as compared with that which preceded it. In subsequent years erysipelas after vaccination was not separately recorded, being included under the heading “cow-pox and other effects of vaccination.” There were 283 such cases in the years 1881–85.

App. IX.

401. During the years 1886 to 1891 the cause of death was in 279 cases certified as connected with vaccination. Many of these cases were the subject of special inquiry by the Local Government Board. We have had before us a summary of the reports made to the Board of the result of such inquiries, prepared for us by Dr. Acland and Dr. Coupland. The reports referred to cover the period from the 1st of November 1888 to the 30th of November 1891. We have ourselves, in many instances, instituted independent inquiry.

402. The cases in which the death has been certified as connected with vaccination cannot all be regarded as cases in which there was the link of causation between them. Indeed, the medical men whose certificates associated the two did not always intend to indicate that the disease which ended in death had its origin in vaccination. There have, no doubt, been other cases in which, although the illness which ended fatally was engendered by vaccination, there has been no mention of it in the certificate of death. Whether these are sufficient in number to counterbalance, or more than counterbalance those in the other category, the evidence does not enable us to say.

6, App. 647.

403. Taking for the moment the 279 deaths during the years 1886 to 1891, certified as connected with vaccination, to have been really so connected, how does this figure compare with the number of vaccinations effected during the same period. The number of primary vaccinations during the years 1890 and 1891 were not put before us by Dr. Ogle, they had not then been published. He stated, however, that in the years 1881 to 1889, inclusive, the number of deaths certified as connected with vaccination was 476. During those same years there were 6,739,902 primary vaccinations,



showing the proportion of one death to 14,159 primary vaccinations. There is, no doubt, that for the years 1886-91, it was not substantially different. For the reasons stated in the preceding paragraph it is not possible to fix with absolute certainty the number of deaths connected with vaccination.

404. In the case of Scotland, during the years 1883 to 1890 inclusive, the deaths registered from cow-pox and other effects of vaccination were 22. During the same years the number of persons successfully vaccinated was 855,185. This shows the number of cases in which the death was stated to have been due to vaccination to be one to every 38,872. It is not easy to say what is the cause of the difference in this respect between England and Scotland. It may be that it is the practice in the latter country to require more evidence of the connexion between the death and vaccination before associating the two in the certificate, though it does not seem likely that this can be the explanation of the whole of the difference. It is worth noting that the proportion of deaths to vaccinated cases is much the smaller in the country where vaccination is postponed to a period three months later. The only other known distinctions between the two countries is that in Scotland only a minority of the cases are vaccinated by a public vaccinator, and that almost all the children are vaccinated at their own homes. 6, App. 631.

405. Since the 1st of June 1889 we have, from time to time, been informed from various sources of cases in which death or non-fatal injury has been alleged or suggested to have been caused by, or otherwise connected with vaccination with a view to their investigation, and since the 14th of February 1891 the Local Government Board have immediately informed us of all such cases brought to their notice. In March 1892 the Home Office addressed a circular letter to coroners throughout England and Wales, requesting that in all cases where they received information that the death of any person, on whose body they proposed to hold an inquest, had been alleged to have been caused by, or to have had any connexion with, vaccination they would communicate immediately with the Commission.

406. From all sources 421 cases in which death or non-fatal injury has been alleged or suggested to have been connected with vaccination, have been brought to our notice, from 1st June 1889 to 1st July 1896. These 421 cases, however, include 19 groups of connected cases, each of which has only been counted as one in arriving at that number. The individual cases included in these groups amount to about 150. Some of these 421 cases were investigated and made the subject of reports by medical inspectors of the Local Government Board. We received reports with reference to a large number of them from medical men appointed by ourselves. In a few cases the nature of the allegation or suggestion rendered it unnecessary in our opinion to make any inquiry into the case. In a considerable number we sought for further information, and after we had considered the further facts thus acquired there appeared to be no necessity for an investigation by the medical men who assisted us by personally inquiring into cases of alleged injury from vaccination. App. IX

407. We have not any means of ascertaining in what number of cases some other disease has supervened on vaccination as a consequence of it, without producing a fatal result. We are able, however, to form some judgment upon this point by observing the number of non-fatal cases to which our attention has been called. We do not mean to suggest that we have been informed of all cases of this nature which have occurred during the last six years. There have very likely been many cases which have not come to our knowledge, where the inflammation set up has been more than usual, and some where a slight attack of erysipelas has resulted. But when we consider that the fact that we were engaged upon this inquiry has been thoroughly well known, and that active organisations and zealous individuals were at work, searching out cases in which the results of vaccination had been abnormal, with a view to bring them under our notice, and that some of those which we were asked to investigate turned out to be of a trifling or unsubstantial nature, we think we are able to form a fairly accurate estimate of the amount of injury which can be plausibly attributed to vaccination. A consideration of all the circumstances has led us to the conclusion that, as regards the non-fatal cases with which we are now dealing, serious injury cannot have resulted in any considerable number of cases.



6, App. 647. 408. An examination of the analysis of the fatal maladies connected with vaccination during the period 1886 to 1891, made by Dr. Ogle, shows that erysipelas is credited with almost one-half of the total number of deaths. To these a considerable number is to be added, where inflamed arms occurred, but in which the disease did not receive the name of erysipelas, though it was probably allied to it. Next in number comes the class, which includes pyæmia, septicæmia, and blood poisoning. If this class be added to cases of erysipelas and maladies allied to it, they account altogether for two-thirds of the cases in which the cause of death has been connected with vaccination. An examination of the particulars of the cases of alleged deaths and injury from vaccination, to which our attention has been called during the last six years, shows that the death or injury has been attributed in the great majority of cases to one or other of these diseases, and chiefly to erysipelas.

409. It must not be forgotten that the introduction into the system of even a mild virus, however carefully performed, is necessarily attended by the production of local inflammation and of febrile illness. If these results did not in some measure follow, the practice would probably fail in its protective influence. As a rule, the inflammation and illness are of a trifling character; in exceptional cases, however, they may exhibit more severity, and, as certain facts submitted to us in evidence have shown, there are cases, though these are rare, where a general eruption may follow vaccination.

410. In order to determine how far the risk of erysipelas is a necessary incident of vaccination, what is the extent of that risk, and how it may best be avoided, it is necessary to consider the various circumstances which may occasion erysipelas and allied diseases in the case of vaccinated children. It is established that lymph contains organisms, and may contain those which under certain circumstances would be productive of erysipelas. It is, therefore, possible that some contagious material (the specific virus of erysipelas, for instance,) may be conveyed at the time of vaccination, owing either to its presence in the lymph employed, or to its being conveyed by the vaccinator himself, or by those with whom the child comes in contact at the time of vaccination. We believe that the cases in which the virus is conveyed at the time of vaccination are rare. It has, however, in some instances been clearly established, the immediate occurrence of erysipelas in several co-vaccinees making it practically certain that some virus was conveyed at the time of the operation. In some instances where this has been the case, and there is every reason for believing that the contagion was conveyed through the medium of the lymph, it is, nevertheless, in evidence that the vaccinator did not display anything more than a slightly inflamed arm. The scrupulous avoidance of inflamed arms in vaccinifers will do much to reduce the risk of conveying erysipelas, in the act of vaccination (a risk which, as we have seen, has been proved to be a very slight one), but it is possible it would not wholly remove it.

6, App. 647. 411. Where the contagious matter which produces erysipelas or blood poisoning has not been conveyed at the time of vaccination the disease must have resulted, when it afterwards displays itself, from a subsequent introduction or development of the poison. It is not always easy to determine whether vaccination has been the cause of, or has contributed to, subsequent erysipelas or blood poisoning. Erysipelas is a common disease in infancy, and not unfrequently leads to death. The evidence of Dr. Ogle shows that nearly two thousand per million die of erysipelas during the first three months of life, and that the mortality rapidly declines as the age advances. Quite apart, then, from vaccination there is nothing remarkable in the occurrence of erysipelas in the case of an infant. The disease is obviously contracted in the majority of cases from some other source. Where a child has been in good health prior to vaccination and is seized with any malady after it, it is not unnatural that the two occurrences should be connected together as cause and effect by those who have not a wide experience of the liability to be attacked by the disease independently of vaccination. It is a common fault too readily to connect together, as cause and effect, occurrences which follow one another in point of time. There can be no doubt that this tendency has sometimes been the reason why, without any real connexion between the two, subsequent illness has been believed to have had its origin in vaccination. The apparent connexion of the two may be a mere chance coincidence.

Illustrations of this have not been wanting. It has sometimes happened that circumstances have led to the vaccination being, on the day appointed for the operation, postponed to a later date. A troublesome skin disease has shortly afterwards mani-



fested itself, which would certainly have been believed to have been caused by the vaccination if it had taken place at the appointed time.

412. In many of the cases which we have had to investigate, where vaccination has been followed by erysipelas, the disease has been present in the immediate vicinity, it cannot therefore be asserted with certainty that in such cases the child would have escaped erysipelas if it had not been vaccinated. Erysipelas may be acquired without any lesion. We do not intend to represent that the wound made in vaccination may not cause an attack of erysipelas, where, if there were no lesion there would be no such attack, but only to suggest that caution is necessary, and that it would be an error to refer all cases of erysipelas, or allied diseases, occurring after vaccination to that operation as their cause.

There can be no doubt that even very slight wounds may lead to erysipelas. It has been induced by scratches from pins, abrasions from the dress and other injuries, in themselves most trivial.

413. We propose to call attention to some of the features which have been observed in the cases we have investigated where erysipelas has ensued upon, and in all probability been connected with, the act of vaccination. We have already said that in some of these cases, erysipelas was prevailing in the neighbourhood, and sometimes even in the immediate vicinity of the vaccinated child. In a considerable number it was reported that the condition of the premises in which the child was living was extremely insanitary. In some it was manifest that there had been a lack of care and attention on the part of the mother or other person in charge of the child. Not unfrequently the wound was in contact with and rubbed by articles of dress very likely to cause inflammation, and cream and other substances were applied to the wounds under circumstances which made the process a source of danger. There were instances in which persons in the habit of nursing a vaccinated child were suffering themselves at the time from running sores, which were very likely the source of contagion. In some cases, too, where the vaccinated vesicles had been opened on the eighth day, erysipelas manifested itself at a time which suggested that it had been acquired at a date subsequent to this opening of the vesicles. *A priori*, this would appear to be a source of danger by rendering an attack of erysipelas more probable if the child came within the reach of contagion. The evidence, however, is not conclusive that erysipelas has, owing to this cause, appeared more often than it would have done if the vesicles had remained unopened. There is an opinion abroad that the taking away of lymph on the eighth day of itself causes some risk of inflammation of the arm. This, however, has not been confirmed by any evidence before us, and it is probable that it is almost wholly an imaginary danger.

414. We have dwelt upon features presented by the cases of erysipelas and various forms of septic disease which have followed vaccination, because they suggest precautions which may be adopted to lessen, if not to prevent, such evils in the future. If, for example, vaccination were performed at the patient's home instead of at a public vaccination place the chance of disease being contracted at the time of vaccination would be to some extent diminished, and the same may be said of the inspection of the vaccinated person which takes place eight days after the operation. On these points we shall have some remarks and recommendations to make at a later stage of our report.

415. A study of the cases which have been made the subject of careful examination and report points to the conclusion that an exercise of greater care would largely diminish the risk, already small, of erysipelas-contagion and blood-poisoning.

Although it may be confidently hoped that by additional care on the part both of vaccinators and parents, the number of inflamed arms and of cases of erysipelas may be reduced to very few, yet it is not to be expected that such occurrences will be wholly prevented. A vaccination wound is like one from any other cause, so long as it exists, a source of some risk.

416. The use of calf-lymph, though it may be supposed to be more free from the risk of conveying erysipelas, does not appear to prevent inflamed arms. Some witnesses have indeed supposed that it is attended with more risk of inflammation than the employment of that taken from the human subject. This opinion has not, however, been corroborated by some of those of widest experience.



417. The evidence given in reference to cases in which one or other of the maladies classed as scrofula has been supposed to have had its origin in vaccination, has usually been of a very vague and inconclusive character. Scrofula is a disease chiefly of childhood, and, being very common, there is nothing to cause surprise in the fact that occasionally children may show its presence in a manner likely to excite suspicion that it was due to vaccination. It may, indeed, easily be the fact that vaccination, in common with chicken-pox, measles, small-pox, and other specific fevers, does occasionally serve as an exciting cause of a scrofulous outbreak. It may, however, not unreasonably be suspected that in all such cases a latent predisposition was already present. The chain of causation is so complicated that it is impossible in isolated cases to arrive at any satisfactory conclusions. To attempt any analysis of the evidence on this subject comprised in Appendix IX. and the various Reports which we have already issued would serve no useful purpose. It must be sufficient to say that after careful consideration of the whole evidence there appears to be no reason whatever to believe that the practice of vaccination tends in any material degree to increase the prevalence of this class of disorders.

418. Precisely the same arguments as those just used are applicable to the chronic skin diseases, chiefly of the type of eczema, which are so often, by the public, attributed to vaccination. Of these numerous supposed instances have been brought before us and the medical men whose assistance we have had. It is to be freely admitted that vaccinia, like varicella, does occasionally cause an irritable condition of the skin which may last long, but it is exceedingly improbable that it is responsible for any substantial increase in the number of chronic skin diseases in children. No sufficient evidence whatever in support of such a conclusion has been brought before us.

Amongst the inconveniences connected with vaccination is the production of contagious forms of eruption, such as have been classed under the names of porrigo and impetigo contagiosa. These eruptions are not attended with any risk to life, nor by any permanent injury to health, and they are usually curable by simple measures. References to these eruptions have been made by many witnesses. Their occurrence has no doubt not unfrequently caused prejudice to the practice of vaccination.

419. As has been already stated, the occurrence of a febrile illness is the desired result of vaccination. To that illness the term vaccinia is applicable, and it may sometimes be attended by an eruption. It is in evidence that vaccinators in the early years after the introduction of the practice, were familiar, not only with severely inflamed arms, but with the frequent occurrence of general eruptions. Familiar as they were with the horrors of small-pox itself, they thought very lightly of events which in the present day would cause much complaint and excite opposition. The greater care now exercised in vaccination, and possibly, above all, the much diminished risk of variolation at the same time, have reduced to a very small number indeed the occurrences referred to. Still it has not been found possible wholly to prevent them, and not only do vaccinators still meet occasionally with inflamed arms and erysipelas, but now and then a case occurs of severe eruption attended by fever, which may end in death. These cases occur exclusively in primary vaccinations and in young infants. They are so infrequent that no well-characterised examples have been brought under the notice of the medical men who have assisted us. A few which had occurred in former years have, however, been the subjects of evidence. These cases may be placed in two groups, one in which the vaccination sores proceed normally, but a general eruption, possibly gangrenous, occurs, and a second in which the pocks inflame, and are attended by satellites, and a more limited eruption, possibly due only to external contagion, is produced. Of the first, only a single example is to be found in the reports (Case 31 : not fatal) before us, but of the second there have been several. One of the most definite of these latter is the case ably and fully reported in the evidence of Dr. Fyson and Dr. Frederick Taylor. In that instance a child previously in good health, and vaccinated with calf-lymph by means of a needle which had never been used before, died about six weeks afterwards with severely ulcerated arms, and ulcers in several parts of the body and limbs. No precaution had been neglected, and the event could only, as in other similar cases, be attributed to what is known as idiosyncrasy on the part of the child, a peculiarity of health attended by exceptional susceptibility to the specific virus of vaccinia.

Cases more or less closely parallel with this one are the Leeds case and one mentioned in the evidence given by Dr. W. G. Little.

Q. 23,019-  
61 ;  
23,062-83.

Q. 20,894,  
et seq.



420. Nothing has produced so deep an impression hostile to vaccination as the apprehension that syphilis may be communicated by it. It was at one time doubted whether syphilis could result, and it was even confidentially asserted that it could not. The fact that this was possible had been fully established, and was generally acknowledged by the medical profession before we commenced our inquiries. Our work has therefore chiefly been to ascertain the extent and character of the risk and the means of its prevention. As a general summary of the evidence on this matter, it may be stated that nothing in the least novel has been elicited, and that no hint has been given of the occurrence of any recent *series* of vaccination-syphilis cases in British practice.

421. In 1856, an extensive investigation undertaken by the Board of Health, under the direction of its Medical Adviser, resulted in the expression of an opinion that there was no proof that syphilis could be communicated in the practice of vaccination. Mr. Simon had issued circular letters of enquiry very widely, and although a few of his respondents had answered cautiously, none had been able to produce convincing facts, and a large majority had expressed entire incredulity. Amongst the latter were Sir Thomas Watson, Sir Charles Locock, Sir Benjamin Brodie, Mr. Acton, Mr. Marson, Mr. Ceely and Sir William Jenner. Facts which were, not long after the issue of Mr. Simon's report, brought before the profession, and which were carefully investigated, made it certain that the negative conclusion which had been arrived at was a mistaken one, and from that time no doubt can have been entertained by any that it is possible to convey syphilis in the act of vaccination. In reference to the frequency of this, the report just referred to is still, however, of high importance. It is impossible to believe that an event concerning the possibility of which almost all the leaders of the profession were in 1856 incredulous can be otherwise than extremely rare.

422. Before proceeding to speak of the facts, or supposed facts, as to syphilis due to vaccination, which have been brought before the Commission, it is necessary to advert to the difficulties of the inquiry. The phenomena of syphilis may be closely approached by those of other disorders, and even when the nature of the malady is evident beyond doubt, there remain numerous sources of fallacy which have to be cleared away before the conclusion can be accepted that the disease has been caused by vaccination.

423. The very close resemblance in certain very rare cases of the results of vaccination, whether with calf-lymph or humanized lymph, to those attributed to syphilis (a resemblance so close that it has caused in a few cases a difference of opinion whether the disease was syphilis or vaccinia) has led to the expression by Dr. Creighton of the opinion that there is some essential relationship between the two diseases. This, however, is a point of speculative, almost it might be said of transcendental pathology, upon which for practical purposes it is useless to enter. It must be sufficient to remark that, whatever may be the relationship alluded to, it exists, if it exists at all, equally between small-pox and syphilis as between vaccination and syphilis. For all practical purposes variola and vaccinia are both wholly distinct from syphilis, and their differences are, with the rarest exceptions, easily recognised. They are alike in being attended by affections of the skin and mucous membranes, and exceptionally by disease of the bones, eyes, and other parts, but in all these it is a question of resemblance and not of identity with which we have to deal.

424. The knowledge of the sources of fallacy just alluded to has compelled the Commission to investigate with much caution the items of evidence which have been offered by the various witnesses whom it has examined. Some of these have manifested a tendency to recognise syphilis after vaccination upon very imperfect and insufficient data.

It is very desirable that every narrative of supposed infection with syphilis in the course of vaccination should be given in full detail. The dates should be accurately fixed, there should be an account of the vaccinifer and of those, if any, who were vaccinated at the same time. It is important too that the statements made should be based upon notes recorded at the time. Narratives which are defective on these points, although they must be taken for what they are worth, cannot ever be accepted as proven. When a witness admits that in so important a matter he took no care to ascertain such facts as those referred to, that his diagnosis was made without consultation with others, and that his statements rest only on his unassisted memory, it



becomes impossible to allow them much weight. Yet such is the character of much of the evidence which has been offered to the Commission on this question.

The cases mentioned by Mr. Ward, of Leeds, in the course of his evidence as recorded at page 218 of the Sixth Report, are the most serious ones as regards this matter which have been brought before the Commission. There can be no doubt that in the case observed by Mr. Ward himself, the disease was syphilis and the chief defect in the narrative is as to proof that it was acquired in vaccination. No information was obtained as to the vaccinifer or the co-vaccinees, and the patient being an adult woman other modes of infection were obviously possible. At the same time it is right to add that the points of vaccination became indurated, and that Mr. Ward was convinced that it was a case of invaccinated syphilis. In the cases referred to by Mr. Ward as having occurred (in 1871) in the practice of Mr. Holmes of Leeds, inquiries subsequently instituted by the Commission have left no doubt that syphilis was conveyed to two (out of six) individuals by vaccination, one of whom died in 1886, it is believed, of syphilis. The vaccinee was at the time the subject of latent taint, and this was revealed very shortly after the vaccination. These cases, it will be seen, occurred 25 years ago, and before the attention of the profession had been directed to this risk so prominently as has since been done.

425. Among the 279 deaths referred to vaccination as a cause during the period 1886-1891, five were attributed to syphilis. Except in cases where an inquest was held, these records are based simply on the certificate given by the medical attendant who certified the cause of death, but who had not necessarily attended the patient during the course of the illness which terminated fatally. Practically all the deaths referred to vaccination as a cause during the years 1889, 1890, and 1891, and some of those so referred during the last two months of the year 1888, have been investigated and reported upon by Medical Inspectors of the Local Government Board. It appears that all the five cases attributed to syphilis after vaccination, during the longer period 1886-1891, were among the cases so reported upon. We have studied these reports and we are satisfied that in none of the five\* cases is there sufficient evidence to show that the death resulted from syphilis caused by vaccination. One of them was the Leeds case,† to which we shall refer immediately. As regards the others, with perhaps one exception,‡ there is abundant reason for believing that they were not cases of syphilis at all.

But besides these five deaths, there were amongst those alleged or suggested to have been connected with vaccination, which were investigated and reported upon by Medical Inspectors of the Local Government Board, eight§ cases in which in the course of the investigation some suspicion of syphilis was raised in connexion with the illness which terminated fatally. In none of these eight cases, however, is there evidence of any value to show that syphilis was communicated by vaccination.

426. Two or three other isolated cases have been brought to our notice which witnesses believed to be examples of this occurrence, but in none of them were the facts such as in our opinion to justify us in concluding with any degree of confidence that the belief expressed had been sustained. On the other hand, a large amount of negative evidence has been offered. Witnesses who had been engaged through long series of years in the very extensive practice of vaccination, bore testimony to their never in their own sphere of observation having witnessed or heard of any case in which the suspicion of vaccination-syphilis had occurred.

At the same time it is not to be forgotten that a natural reluctance to register deaths as due to syphilis may have prevented some cases where recently vaccinated persons have died from that disease from being made public.

427. Only a few items of the evidence produced before us appear to require special notice: among these, the most prominent is what has been known as the "Leeds case," upon which we have heard the evidence of Mr. Ward, Mr. Littlewood and Dr. Barrs. The witnesses named regarded it as a case of syphilis, conveyed by vaccination, but all of them admitted that the course of events was most unusual. We have carefully investigated this case, and notwithstanding the opinion formed by the witnesses, there appears good reason to doubt whether it was one of syphilis. The case was made the subject of careful inquiry by Dr. Barlow on our behalf, who shared the doubt we have expressed. The view taken by the Medical Inspector of the Local Government Board who in the first instance investigated the case was that it was a case of hereditary syphilis. It seems certain, however, that the parents of the child whose death was in question were not in any way affected with syphilis. The

App. IX.

Q. 27,254-62.

[\* *i.e.*, Cases XLVI., XLVIII., XLIX., XC., and CXLVII. of the Local Government Board series.]

[† Case XC.]

[‡ Case XLVI.]

[§ *i.e.*, Cases XLV., XLVII., LXXII., CXXVII., CXXIX., CLXXI., CLXXXI. and CXCVI.]

Q. 23,574-

746;

23,747-858;

23,859-912.

App. IX.,

reports on

Case i.



vaccinifer also appeared to be free from any taint of that disease, and its family history confirmed this view. The co-vaccinees from the same lymph also exhibited no trace of syphilis. These facts of themselves make out a strong case against that having been the nature of the disease. Coupled with the fact that it could not have been communicated by the vaccinator himself, they seem to render it practically impossible that syphilis was the cause of death. If the symptoms exhibited had in all respects corresponded with those which are known to characterise syphilis, the proper inference might have been that there was some error in ascertaining the facts of the case. But it is beyond question that the course of events was very different in some respects from that experienced in undoubted cases of syphilis, and we think the true conclusion is that it was not a case of that disease. It may probably be classed with a few others as examples of gangrene and blood poisoning, the direct result of vaccination, which are not to be explained by supposing the introduction of any syphilitic or other poison. Fortunately, such cases are extremely rare, so much so that the witnesses concerned knew of no case precisely parallel.

428. The evidence given by Dr. Robert Lee and Dr. Coutts, the former, physician of the Ormond Street Hospital for Children, and the latter, formerly a resident medical officer to the same institution, may be taken as relating to one and the same case. Both these witnesses testify to the abundant occurrence of the ordinary forms of congenital syphilis in the practice of that institution. Each of them mentions one single case in which it was believed that syphilis was communicated in vaccination and that the vaccination-sore became a chancre. Although it is not established in evidence that these witnesses were speaking of the same case, it is almost certain that they were, as Dr. Coutts expressly states that the child was Dr. Lee's patient. Neither of the witnesses knew more of the case than its earliest stages, and both were subjected to questions the answers to which left much doubt as to the correctness of the diagnosis. Whilst, however, syphilis cannot by any means be said to have been proved, the case must stand as one of reasonable suspicion, and Dr. Coutts' statement that another infant (not seen) vaccinated from the same source was said to have suffered in a similar way gives some support to Dr. Lee's opinion. It is of much importance to note that out of an experience of 30,000 children, at an institution beyond all others likely to attract cases of this kind, this was the only example of supposed transmission of syphilis in vaccination which Dr. Lee had ever known.

429. In considering those cases specially investigated by medical men on our behalf, we have as a rule the advantage of definite and adequate information. We have already mentioned that in the Leeds case,\* upon which we heard evidence, we had the benefit of Dr. Barlow's assistance; and we need not further discuss that case. Amongst the others investigated by medical men on our behalf were two† cases in which death was apparently certified as from vaccino-syphilis. The first‡ of these two deaths was registered, in 1892, as due to "vaccinia syphilitica; marasmus," but it subsequently appeared that the medical man who certified the death had not intended to state that it resulted from syphilis caused by vaccination. In explanation of his certificate, he said: " . . . the meaning I intended to convey was 'vaccinia,' i.e., a general " eruption over the body exactly like the vaccination pocks occurring in an infant the " subject of congenital syphilis"; and a careful inquiry by Dr. Acland elicited overwhelming evidence in support of the view that the case was one of inherited syphilis. The second§ of the two deaths was registered, in the present year, as due to "vaccination of syphilis." A thorough investigation showed that the case was certainly not one of syphilis caused by vaccination, and in all probability not one of syphilis at all.

Two|| other cases, both fatal, were reported to us in which children whose vaccination had undoubtedly been followed by serious illness were believed to have been subjects of inherited syphilis. Both cases were very carefully investigated by Dr. Acland on our behalf. In neither of them is there any evidence that syphilis was communicated by vaccination. Probably both children were, as at first surmised, subjects of inherited syphilis.

Besides these deaths, there were amongst those alleged or suggested to have been connected with vaccination, which were investigated and reported upon by medical men on our behalf, ten¶ cases in which in the course of the investigation some suspicion of syphilis was raised in connexion with the illness which terminated fatally. In none of these ten cases, however, is there evidence of any value to show that syphilis was communicated by vaccination; possibly five\*\* of them were cases of inherited syphilis. The other five†† were certainly not cases of syphilis at all.

Q. 30,238-560; 30,632-731.

[\* Case 1 of the Commission's series and Case XC. of the Local Government Board's series.]

[† i.e., Cases 109 and 416 of the Commission's series.]

[‡ Case 109.]

[§ Case 416.]

[|| i.e., Cases 207 and 326.]

[¶ i.e., Cases 52, 94, 113, 192, 195, 202, 215, 216, 309, and L.E.J. in Case 227 [series].]

[\*\* Cases 195, 202, 215, 309, and L.E.J. in Case 227 [series].]

[†† Cases 52, 94, 113, 192, and 216.]



[† i.e. Cases 12 and 13; E.M.S. in Case 21 [series]; the following in Case 139 [series], A.E.L. (No. 426 in the vaccination register), A.L.C. (No. 408), J.E. (No. 409), W.E.W. (No. 424), J.P.F. (No. 429), F.M.D. (No. 440), N.G.S. (No. 449), A.F. (No. 451), F.J. (No. 453), H.L. (No. 455), E.J.S. (No. 456), F.R. (No. 458), E.J. (No. 459), A.J.L.C. (No. 467), M.M. (No. 469), and L.H. (No. 484); Cases 141, 142, 143, 144, 145, 146, and 180.]

[§ In Case 139 [series], namely, A.F., No. 451 in the vaccination register.]

[|| Case 141.]

[¶ i.e. Cases 11, 102, 128 and 129; the following in Case 140 [series], M.W. (No. 6 of series), C.C. (No. 23), J.H. (No. 24), A.N. (No. 25), A.J.A. (No. 64), and W.B. (No. 69); Cases 175 and 187; and C.M.J. in Case 227 [series].]

[\*\* C.M.J. in Case 227 [series].]

Turning now to the *non-fatal* cases investigated by medical men on our behalf, we have had brought to our knowledge with a view to such investigation 26‡ *non-fatal* cases where syphilis was alleged to have been, or as to some few of the cases *possibly* to have been, communicated by vaccination. One§ of these 26 cases could not be traced by the medical men whom we asked to investigate it. It had been reported to us, with 21 of the other 25 cases, by a gentleman whose only information as to the case, obtained from a relative of the child's, was that "the child had a frightful arm, " and broke out badly everywhere, and was a very long time of getting better." The remaining 25 cases were, however, carefully investigated on our behalf, some by Dr. Barlow, some by Dr. Acland, and 15 of them by those gentlemen jointly. In 24 of the 25 there is no evidence that syphilis was communicated by vaccination; indeed, none of the 24 were cases of syphilis at all. In the remaining case|| it appears that there was some ground for the allegation, though it is by no means proved that syphilis was communicated by vaccination, or even that the case was one of syphilis at all. The case, brought to our notice in 1892, was that of a boy born in 1880 and vaccinated in the following year. When examined on our behalf in September 1892 he presented no unmistakable signs of having suffered from syphilis, either inoculated or inherited. The length of time which had elapsed, and the absence of any record, made it impossible to trace the source of lymph. The history of the boy's illness is extremely uncertain, but upon the whole, if it can be relied upon at all, it tends to render some support to the view that syphilis was communicated by vaccination or by contamination of the vaccination wounds.

Besides the *non-fatal* cases to which we have just referred, there were amongst those investigated by medical men on our behalf, in which *non-fatal* injury had been alleged or suggested to have been caused by vaccination, 13¶ cases in which in the course of the investigation some suspicion of syphilis was raised in connexion with the illness which followed vaccination. In none of these 13 cases, however, is there evidence of any value to show that syphilis was communicated by vaccination; one\*\* was a case of inherited syphilis, and the other 12 were not cases of syphilis at all.

430. The evidence offered to us would lead to the belief that whilst with ordinary care the risk of communication of syphilis in the practice of arm-to-arm vaccination can for the most part be avoided, no degree of caution can confer an absolute security. The rejection as vaccinifers of young infants, say below four months of age (in whom congenital syphilis may be as yet undeclared), and of adults (in whom the disease may possibly have been recently acquired) are precautions which would probably shut out almost the whole of the risk. The outbreaks of syphilis in connexion with vaccination which have been mentioned to the Commission (all of which had been previously published) have occurred chiefly in arm-to-arm vaccination amongst soldiers, or from the use as vaccinifers of young infants the offspring of parents whose history was not known to the vaccinator. It must, however, be admitted that neither the examination of the vaccinifer if taken alone, and without a knowledge also of the parents, nor the most scrupulous avoidance of any visible admixture of blood with the lymph, are in themselves, however valuable, sufficient absolutely to exclude risk. The evidence given by Dr. Husband, of the Vaccine Institution of Edinburgh, established the fact that all lymph, however pellucid, does really contain blood cells. Absolute freedom from risk of syphilis can be had only when calf-lymph is used, though where the antecedents of the vaccinifer are fully ascertained, and due care is used, the risk may for practical purposes be regarded as absent.

431. As regards the possible effect of vaccination in increasing the prevalence of leprosy, no affirmative evidence has been brought before the Commission which in their opinion establishes that this effect has resulted from the practice. On the other hand, much of a strongly negative character has been produced. The evidence which has been supposed to give support to the suspicion that leprosy has been caused by vaccination is of two kinds. First, the recent increase of leprosy in certain districts simultaneously with an increase of vaccination, and secondly, the assertion that in isolated cases leprosy has really followed the practice of vaccination. In regard to the former of these supposed arguments, it has been shown in evidence that there has been no general relationship between the increase of vaccination and the increase of leprosy. Whilst in a few places, of which the Sandwich Islands offer by far the most definite example, leprosy has very largely increased during vaccination periods; in others, New Zealand, for instance, it has died out, and in others, such as Norway, Iceland, and India, it has probably undergone decline. The evidence of Dr. Beaven Rake, a gentleman of great experience of leprosy as it occurs in the West Indian Islands



and a member of the Commission recently sent out to report on the causes of leprosy in India, was definitely opposed to the belief that vaccination had any share in its spread. As regards the allegation that in certain individual cases vaccination had produced leprosy, there is no conclusive evidence.

The supposed risk of conveying leprosy in vaccination may be wholly got rid of by using English lymph or that from the calf.

432. As regards the almost infinitesimal risk of syphilis, it must be admitted that re-vaccination cases stand in the same position as primary ones. In reference to other dangers, however, the risk is even less in the case of adults than we have indicated it to be in the case of infants. This is a fact of great importance when the necessity for re-vaccination to which we have already directed attention is remembered.

433. It is obvious that the employment of calf-lymph only would wholly exclude the risks as regards both syphilis and leprosy. Respecting the latter disease, however, there appears to be reason to doubt whether any risk exists, and at any rate it does not concern the British population. Even in leprosy districts the employment of English human lymph would be, so far as leprosy is concerned, as safe as that from the calf. The risk of syphilis, although real, is an exceedingly small one, even when humanized lymph is employed, and may probably be wholly avoided by care in the selection of the vaccinifer. As regards all the other dangers, whether of severe illness or temporary inconvenience, the two forms of lymph appear to stand on the same level. The instances of inflamed arms, of erysipelas, of vaccinia maligna, and eczematous eruptions are not more common after the use of human lymph than after that from the calf. Some of the best qualified witnesses who have afforded us their assistance have expressed a deliberate preference for arm-to-arm vaccination, believing that the advantages of calf-lymph are more imaginary than real.

434. A careful examination of the facts which have been brought under our notice has enabled us to arrive at the conclusion that, although some of the dangers said to attend vaccination are undoubtedly real and not inconsiderable in gross amount, yet when considered in relation to the extent of vaccination work done they are insignificant. There is reason further to believe that they are diminishing under the better precautions of the present day, and with the addition of the further precautions which experience suggests will do so still more in the future.

(C.) *As to whether any, and, if so, what means should be adopted for preventing or lessening the ill effects, if any, resulting from vaccination; and whether, and, if so, by what means, vaccination with animal vaccine should be further facilitated as a part of public vaccination.*

435. We are asked further to inquire and report whether any, and, if so, what means should be adopted for preventing or lessening the ill effects, if any, resulting from vaccination, and whether, and, if so, by what means, vaccination with animal vaccine should be further facilitated as a part of public vaccination.

436. We have already, in connexion with a discussion of the nature and extent of any injurious effects which result from vaccination, indicated some means which might be adopted for preventing or lessening those ill effects. It will be well, however, even though it may involve some repetition to deal with them all together in this section of our Report.

437. We put the use of calf-lymph in the forefront because, as we have said, this would afford an absolute security against the communication of syphilis. Though we believe the risk of such communication to be extremely small where humanized lymph is employed, we cannot but recognise the fact that however slight the risk, the idea of encountering even such a risk is naturally regarded by a parent with abhorrence. We think, therefore, that parents should not be required to submit their children to vaccination by means of any but calf-lymph, but this should not preclude the use of humanized lymph in case they so desire.

So long as the State, with a view to the public interest, compels the vaccination of children, so long even as it employs public money in promoting and encouraging the practice, we think it is under an obligation to provide that the means of obtaining calf-lymph for the purpose of vaccination should be within the reach of all. We have no hesitation, therefore, in recommending that steps should be taken to secure this



result. Whether the duty of providing calf-lymph should be undertaken by the Local Government Boards in the several parts of the United Kingdom, or whether some other method would be more advantageous, can be better determined by those who have had practical acquaintance with the working of the vaccination laws.

438. We have already noticed that whilst in Scotland the age within which vaccination is obligatory is six months from the date of birth, in England and Wales and in Ireland it is three months from that date. There is obviously no good reason for this want of uniformity. We have come to the conclusion that it would be well, at all events, to extend the age period in England and Wales and in Ireland to six months from the date of birth.

It is difficult to judge how far untoward incidents of vaccination would be likely to be lessened if the operation were postponed to a later age than three months. Looking at the circumstance that the tenure of life in children of a very early age is frail, and that where a disease supervenes upon vaccination the ability to battle against it may determine whether the result is fatal or not, or to what degree injurious, we should *a priori* think that the chances of death or injury from such a cause would be less, looking at the matter as a whole, when the age of the child was more advanced.

The evidence in our possession bearing upon the point is very slight. It consists only of the fact, to which we have called attention, that the return of deaths connected with vaccination in Scotland shows a much smaller proportion in comparison with the number of children vaccinated than in England. We have pointed out that there may be other explanations of this phenomenon, but so far as it goes it lends some support to the *a priori* view we have indicated.

We are aware that one consideration which led to the reduction of the period in Ireland to three months was that it would lessen the difficulty of tracing defaulters due to removals. But the experience of Scotland seems to show that the difference in this respect, whether the longer or shorter period be adopted, is not very grave.

439. We are quite alive to the objections which may be urged against a prolongation of the period within which vaccination must be performed. It will naturally be said that a number of children, who otherwise would be protected against small-pox, would be left without that protection, and would thus be liable to suffer from the disease themselves, and be a source of danger to others. It must be remembered, however, that so long as children cannot walk, the risk of their contracting contagion is less than if they were able to move freely about and mix with other people, and that, for the same reason, the risk of their communicating contagion to others is less. We cannot trace in the statistics relating to Scotland any grounds for believing that the later compulsory vaccination age which prevails in that country as compared with England has affected, to any substantial extent, the general small-pox mortality of Scotland, though no doubt it may have led to some deaths among children under six months of age which otherwise would not have taken place.

We have already shown how satisfactory a position Germany has occupied in relation to small-pox since the year 1874. The age of compulsion in that country is the end of the next calendar year after birth. It is true that re-vaccination has been there made compulsory as well as primary vaccination, but we think the experience of Germany is not without its bearing on the question we are now considering. Wherever the line is drawn, whether at three months or six months, it will always leave a class of unvaccinated persons. The age to be fixed is a question of policy into which many considerations must enter. If an extension of the age within which vaccination was required rendered its untoward incidents fewer in number, and diminished hostility to the operation, it may be that on the whole it would promote the cause of vaccination, and secure, as its result, that the number of vaccinated persons would be greater than at present.

440. The truth is that it is only when an epidemic breaks out in any place that the vaccination of very young children becomes a question of grave importance. An epidemic is not likely to originate, nor in its early days to grow, owing to the non-vaccination of that class.

If, then, security could be obtained that whenever a case of small-pox occurred in a sanitary district, children within the range of the present compulsory law should be vaccinated, we think the protection against small-pox would not be substantially less than it is at present. Without some such provision as this, we should not be prepared to recommend an extension of the age beyond the period allowed in Scotland. With such a provision, we think that the age might be advantageously extended to one



year from the date of birth, and that the number of cases in which death was, whether correctly or not, attributed to vaccination would then much diminish. A provision of this kind would, however, no doubt, involve some practical difficulties.

441. Our attention has been called to the fact that in some workhouse infirmaries and lying-in hospitals it has been the practice to vaccinate children within a few days of their birth. Although under favourable conditions vaccination may be successfully carried out at that early age, we think the practice is to be deprecated unless there be at the time obvious danger of small-pox contagion. In the exceptional cases in which vaccination becomes, on that account, necessary, the infant should, if possible, be kept under observation until the arm is healed. And we think that, in these cases, it is very undesirable to vaccinate in four or five places; the operation should be limited to a single insertion of the vaccine matter.

442. A study of the reports in our possession relating to cases in which erysipelas or septic disease has followed vaccination teaches no lessons more forcibly than these—that any abrasion of the vaccination vesicles by clothing of a nature likely to irritate them should be avoided, and that foreign substances should not be rubbed into the wounds under circumstances calculated to set up inflammation. It is most important, too, that any rags or other materials applied to the place of vaccination should be scrupulously clean. The want of care in these respects on the part of the parent or person in charge of the child has frequently been a source of mischief. If more care were exercised much good would result. Parents and others in charge of children are frequently unaware of the importance of these matters, and of the evil which may follow from a disregard of them. We think it would be well that a warning on the subject should be addressed to such persons. It has been the practice of some public vaccinators to take this course. It is desirable that the practice should be universal, and that the Local Government Board should settle a suitable form containing clear and simple rules for guidance in the care of the vaccinated arm, and for the avoidance of any likely source of injury or irritation of that part. If this were done untoward incidents might, we think, be largely diminished.

443. We have already drawn attention to the fact that some cases of disease contracted through vaccination might be avoided if the operation were performed at the child's home, instead of at a public vaccination station. At present the child has not unfrequently to be taken twice to a considerable distance, first for the operation itself, and then for the subsequent inspection. This sometimes involves exposure to inclement weather which is of itself, hazardous. Besides this a considerable number of children are often collected both on the occasion of the vaccination and of the inspection, and the risk of contagion is thereby increased. If children were vaccinated and inspected, as a rule, at their own homes, instead of being brought to a public station, we believe the risk of injury would be sensibly lessened.

444. A medical man attending at the child's residence would be better able than the public vaccinator ordinarily can be to judge whether circumstances made it expedient to postpone vaccination for a time.

The insanitary conditions in which a child was living have often afforded an explanation of septic diseases which have supervened on vaccination. These conditions would be better known by a medical man visiting the home than by a public vaccinator to whose station a child is brought.

445. There can be no doubt that vaccination ought to be postponed when erysipelas, scarlet fever, measles, or chicken-pox are prevalent in the neighbourhood of the child's residence, or, if the child is not to be vaccinated at home, either there or near the place of vaccination. Here again there would be a gain if the home was more often the place of vaccination.

446. It would, in our opinion, be an advantage if the postponement of vaccination, were expressly permitted, not only on account of the state of the child, but of its surroundings and any other conditions rendering the operation at the time undesirable. If more discretion in this respect were possessed and exercised, we think untoward results would become even rarer than they are.



If provision could be made in cases in which insanitary conditions would cause risk to a child, if it remained at home whilst the vaccination wound was unhealed, for its removal elsewhere during that period, we think it would be desirable.

447. We think that the vaccination vesicles should not be opened unless for some adequate reason. We have already said that in our opinion the importance of this has been exaggerated, but the precaution is nevertheless a wise one, and may be of use.

448. We think that safety would be increased by preserving the lymph in tubes instead of on "dry points." There is some difference of opinion on this matter amongst those with whose opinions we have been furnished. On the whole, however, we think the weight of experience as well as reason is in the direction we have indicated.

In connexion with this subject, our attention has been drawn to the experiments recently made by Dr. Copeman as to the effect of the storage of vaccine lymph in glycerine. The conclusions at which he arrives are that the addition of glycerine, whilst it leaves the efficacy of the lymph undiminished or even increases it, tends to destroy other organisms. If it be the fact that the efficacy of the lymph remains unimpaired, its storage in glycerine would largely diminish the difficulties connected with the use of calf-lymph, which are inseparable from calf to arm vaccination. The investigation has not yet reached a point at which it is possible to pronounce with certainty whether the anticipated results would be obtained. And it was at one time suggested that the introduction of glycerine was likely to be mischievous. The question is one a further investigation of which is obviously desirable.

If lymph is to be preserved in glycerine, due care would be requisite to ensure its purity and the absence of contamination in its introduction. We think that, whether mixed with glycerine or not, each tube should contain only sufficient lymph for the vaccination of one person.

449. Another precaution which ought to be insisted on is that no instrument should be used for the operation which has not been boiled or otherwise sterilised for the purpose; and the simpler the instrument employed the better.

Care should be exercised, too, not to place the insertions too near together, so as to injure the vitality of the tissues between them.

450. We think the time at present fixed for inspection of the vaccinated arm is somewhat too early, and that some time during the second week after vaccination should be substituted for the eighth day; and, moreover, that another inspection should be obligatory in the third week after vaccination. If summoned by the parent on account of any unfavourable symptoms prior to the time fixed for inspection, the vaccinator should be bound to attend, and notice should be given to parents of their right thus to summon the public vaccinator.

The amount of the fee to be received by the vaccinator would, of course, require to be determined with reference to the duties which it is proposed to impose upon him. We think the fee should be adequate to cover all these duties.

In any case where a child requires medical attendance owing to illness supervening on vaccination, we think it should be the duty of the vaccinator to render such attendance if required by the parent, and that he should receive a fee in respect thereof.

In our opinion, if the precautions we have suggested were adopted, untoward incidents of vaccination, already rare, would become much rarer.

*(D.) As to what means, other than vaccination, can be used for diminishing the prevalence of small-pox; and how far such means could be relied on in place of vaccination.*

451. Another question upon which we are asked to report is, what means, other than vaccination, can be used for diminishing the prevalence of small-pox; and how far such means could be relied on in place of vaccination.

452. The means other than the inoculation of small-pox or cow-pox, which have been referred to by witnesses as being capable of diminishing the prevalence of small-pox, are such means as have been employed against infectious diseases generally; they may be summarised as—1. Measures directed against infection, *e.g.*, prompt notifica-



tion, isolation of the infected, disinfection, &c. 2. Measures calculated to promote the public health, the prevention of overcrowding in dwellings or on areas, cleanliness, the removal of definite insanitary conditions, &c.

The principle underlying the practice of isolation with its accompanying machinery is obviously the very opposite of that which recommended the practice of inoculation; it aims at exclusion of the disease, whereas inoculation aimed at universal acceptance by artificially "sowing" or "buying" the disease. Except in regard to the plague our knowledge and practice of measures of isolation and quarantine against epidemics is of relatively recent growth. As the result of increased knowledge of the mode of propagation of infectious diseases, of greater sanitary activity, and under the stimulus of legislation, organised effort, more or less thorough, is now, in this as in other countries, directed against the spread of dangerous infectious diseases. Side by side with a vaccination system, means of isolation, &c., have been successfully employed to check the spread of small-pox. They have also been sometimes so employed in recent years in places where vaccination has fallen into disuse.

453. It will be well to commence with a brief statement of the growth of our knowledge on the subject of isolation as a means of dealing with infectious or contagious diseases. We have already adverted to the fact that small-pox is highly contagious, and that contagion from those suffering from it is the means by which the disease is propagated.

454. Although reference to infection appears in some of the Arabian writers, the contagiousness of small-pox attracted little attention in this country and in Western Europe until the 18th century. Sydenham (1624-1689) though he refers to the contagiousness of small-pox, did not dwell upon the matter and did not regard it as so important an element in the spread of the disease as some peculiar constitution of the atmosphere to which he attributed epidemics. Boerhaave was the first at the commencement of the 18th century distinctly to formulate the now generally accepted doctrine that small-pox arises only from contagion.

455. In 1720, Mead drew up an elaborate system of notification, isolation, disinfection, &c. in view of a threatened invasion of the plague, but no attempt to deal with small-pox in a similar fashion appears to have been made until the last quarter of the 18th century. This was in all probability largely due to the adoption of inoculation as the recognised defence against small-pox, and the acceptance of Sydenham's doctrine of epidemic causation may have exercised an influence in the same direction.

456. No writer appears to have suggested methods of isolation, disinfection, &c. against small-pox prior to 1763. In that year Rast of Lyons published his *Reflections on Inoculation and Small-pox*, and upon the means which might be taken to deliver Europe from that malady. He maintained—1. That small-pox was not a necessary and inevitable malady. 2. That it arose only from contagion. 3. That it resembled plague in most of its features. His conclusion was expressed in these terms: "I say, that to deliver Europe from small-pox we must act upon principles directly opposed to inoculation; far from multiplying the contagion we must keep it away by taking the same precautions and employing the same measures against that malady as have proved so successful against leprosy and the plague."

The earliest account of the practical employment of such means is from Rhode Island, U.S.A. Haygarth, on the authority of Drs. Moffat and Waterhouse, states that for many years prior to 1778 small-pox had been successfully prevented from becoming epidemic there by regulations for isolation of the infected on a neighbouring small island specially used for that purpose, and for quarantining infected vessels, destruction of infected clothing, &c. Moreover, inoculation was discouraged at Rhode Island, and those who wished to be inoculated had to go to some place away from the Island, and were not to return until there was no danger of their infecting others.

457. A passage in Dimsdale's work on *Inoculation*, published in 1781, shows that in some towns of England pest-houses were beginning to be used for small-pox. In 1784 Haygarth, of Chester, published his "*Inquiry how to prevent the Small-pox*," and in 1793 "*A Sketch of a Plan to Exterminate the Small-pox from Great Britain*."

The great epidemic of small-pox at Chester in 1774, to which allusion has already been made, was the occasion of Haygarth's first attempts at organised dealing with epidemics of small-pox with a view to prevention. In his *Inquiry* he combated



Sydenham's doctrine that epidemics are due to some occult condition of the atmosphere, and argued that small-pox was always spread by infection only. He further maintained that the variolous poison could be carried as an infection for a little distance only through the air, and "consequently that the small-pox may be prevented by keeping persons liable to the distemper from approaching within the infectious distance of the variolous poison till it can be destroyed." These views led him, upon the return of an epidemic in 1777, to propose a plan for the prevention of the natural small-pox, and in 1778 a society was formed to carry out the plan in Chester. The plan consisted on the one hand of a general inoculation at people's homes at stated intervals, on the ground that the inoculated small-pox was far less fatal or injurious than the natural small-pox, and on the other hand of "Rules of Prevention" based on Haygarth's views of infection. In the report of the society, called shortly "The Small-pox Society," dated September 1782, it is stated that in the  $4\frac{1}{2}$  years of its existence two general inoculations had been held, and that the deaths from small-pox had been greatly lessened. Great difficulties, however, were met with. "A large portion of the inhabitants" refused inoculation, and a large proportion also "being fearless, or rather desirous, that their children should be infected with the natural small-pox," refused to obey the Rules of Prevention. Hence, though the same report states that the example of Chester had been followed by Liverpool, where "a general inoculation was successfully executed in the autumn of 1781 and another in the spring of 1782," and in Leeds, where a general inoculation was held in 1781, and another proposed in 1782, with such success that the Royal College of Physicians in Edinburgh appointed a committee to inquire into "the modes of conducting the general inoculations of the poor" thus adopted in these places, the plan met with such difficulties that it was ultimately abandoned. It will be observed that a general inoculation was an essential part of the plan proposed and carried out in 1778-82; but, writing in 1784, Haygarth looked forward to being able ultimately to dispense with inoculation, and in the preface to his later edition, published in 1793, he states more definitely that the adoption of his Rules of Prevention without any general inoculation might exterminate small-pox in some country other than Great Britain. It must be remembered, however, that Haygarth entertained the opinion that the infection of small-pox could not be carried through the air above about half a yard, and that no one could be infected by the clothes of a person visiting a small-pox patient provided that he kept beyond this distance from the patient. It is obvious that if this had been established the control of the disease by isolation would be a much simpler matter than it really is.

458. In the *Medico-Chirurgical Review* for 1796 there appeared an account of a work by Dr. Faust of Leipsic, entitled "An essay on the duty of man to separate persons infected with the small-pox from those in health, thereby to effect the extirpation of that disease equally from the towns and countries of Europe," in which it was argued that the first person ill in a place is the only source from which all the rest, perhaps hundreds and thousands, become affected, and that if he were put immediately into a situation where he could not injure by contact those who had not had the disorder, the spread of the disease would be prevented.

In the same *Review* for 1799 appeared an account of establishments for the extirpation of small-pox. The failure of inoculation to attain the desired end is referred to, and legislation is urged to facilitate isolation. It is further stated that in 1796 the Prussian College of Physicians reported favourably to the King on the project, and that at Halberstadt it had been resolved to establish a house for the purpose. At Côte d'Or in France a similar plan had been tried with success.

459. In 1798 Jenner's *Inquiry* was published, and in the early years of this century inoculation began to be discouraged; for a while the prospects of annihilating small-pox by vaccination appear to have superseded, in the minds of many, the plans of Haygarth and others. Some vaccinators, however, like Willan and Ring, still looked to methods of quarantine and to national and municipal regulations promoting isolation to exterminate the small-pox.

It is worthy of notice, too, that Haygarth himself, in a letter quoted by Dr. Cappe of York in a communication to the *London Medical and Physical Journal* (Vol. IV., p. 429), dated October 13th, 1800, remarked, "an introduction of the vaccine still more than of the variolous inoculation would effectually promote the great object of my publications."

460. Prior to the year 1866 there was no provision made by law for enabling sanitary authorities to establish hospitals for infectious diseases and thus to promote



the isolation of such cases. The only institutions of that description then existing were the result of private effort. So far as regards small-pox there was, practically speaking, no provision for its treatment by means of isolation.

461. The Sanitary Act of 1866 empowered, though it did not compel, local authorities throughout England and Wales, Scotland, and Ireland, to provide or to join in providing isolation hospitals for the use of the inhabitants of their districts. There was further legislation on the subject by the Public Health Act, 1875; the Public Health (London) Act, 1891; the Public Health (Scotland) Act, 1867; and the Public Health (Ireland) Act, 1878, into the details of which it is not necessary to enter. The most recent Act relating to the matter is the Isolation Hospitals Act of 1893, which applies to the small towns and rural districts of England and Wales.

462. In London the local authorities to whom the power to provide isolation hospitals was given by the Sanitary Act of 1866 were in the City the Commissioners of Sewers and in other metropolitan districts the Vestries or District Boards. With few exceptions these authorities did not exercise the powers conferred on them, and, speaking generally, it may be said that the Sanitary Act of 1866 had practically no effect in London as regards the provision of hospital accommodation for small-pox. Some few of the metropolitan workhouses, however, had infectious wards attached in which cases of small-pox were treated, and the guardians of some of the unions sent cases by arrangement to the small-pox hospital at Highgate. This institution, which had been established in 1746, was extended in 1850 so as to provide accommodation for about 100 small-pox patients. It remained down to the year 1870 the only small-pox hospital in London.

463. The obvious difficulty and danger attending the treatment of persons suffering from small-pox in the same institutions in which other destitute persons are practically forced to reside led to the enactment of certain provisions of the Metropolitan Poor Act of 1867 and to the issue under that Act of an order of the Poor Law Board virtually uniting the whole metropolis into one district for the purpose, amongst others, of providing hospital accommodation for paupers suffering from small-pox.

464. Although the Metropolitan Asylums Board had power to provide hospital accommodation for paupers only, they found it practically impossible to confine the inmates of their hospital to this class owing to the epidemic which prevailed at and after the time when their first hospital was opened in December 1870.

465. In 1879, by the Poor Law Act of that year, power was given to the Metropolitan Asylums Board to contract with the local authorities for the reception into the Board's hospitals of any persons suffering from small-pox or other dangerous infectious disorder within their districts, but it was not until 1889 that express power was given to the Asylums Board by the Poor Law Act of that year to admit persons reasonably believed to be suffering from small-pox who were not paupers.

It will thus be seen that the hospitals of the Asylums Board have been practically the only isolation hospitals available for London, though to some extent the Highgate Hospital has served the same purpose.

466. A return made in 1879 showed that at that time 296 out of 1593 (or about 18 per cent.) of the sanitary authorities of England and Wales, other than the Metropolitan or port sanitary authorities, had made some provision for the isolation of cases of infectious disease. A similar return relating to the conditions existing in December 1892 shows that by that time 36.6 per cent. of the same sanitary authorities (representing districts together containing 62.1 per cent. of the total inhabitants) had some provision for the isolation of infectious diseases, either in hospitals of their own or by arrangement with neighbouring authorities, and that 20.4 per cent. of these authorities (representing districts containing together 44.6 per cent. of the total inhabitants) had special accommodation for small-pox patients. In addition, it appears that 45 of the 57 port sanitary authorities then existing (exclusive of the Port of London) in England and Wales had arrangements of some kind for the isolation of infectious diseases; 12 of these 45 then having special accommodation for small-pox patients.

467. The value of isolation in restricting the spread of small-pox has been long acknowledged by the Medical Officers of the Local Government Board.



Dr. (afterwards Sir George) Buchanan, in a report made in 1874, expressed the opinion that "small-pox, as well as other infections, is capable of being wonderfully limited by isolation in hospital, and the amount of provision made for such isolation may be expected to affect materially the rate at which an epidemic of small-pox becomes extinguished." In proof of this he adduces a striking comparison of the behaviour of the epidemic of 1870-1 in Birmingham, London, and Coventry. Again, the 1871 epidemic was prolonged in Plymouth, but quickly extinguished in adjacent Devonport, the only difference between the two being the more rapid and copious hospital provision in the case of the latter.

468. Evidence bearing on the same point was given by Dr. Thorne before the Royal Commission which in 1881-2 inquired into the subject of small-pox and fever hospitals in London.

Speaking of hospitals for infectious diseases generally, he said, "The evidence is so abundant that I could occupy you for hours in telling you of instances in which epidemics have evidently been prevented by the isolation of first cases of infectious disease."

As regards small-pox in particular, he cites two striking examples, "Before the erection of the Delancey Hospital at Cheltenham, small-pox had frequently led to some considerable mortality; in 1858 it caused 52 deaths, in 1861, 12 deaths, in 1865, 32 deaths, but during the six years which had elapsed between the provision of the hospital and my inquiry, small-pox had been imported into Cheltenham on 12 different occasions; the imported cases were, in every instance, removed to the hospital, and in no single instance has the disease spread beyond the house first attacked!" Again, he says: "At Birkdale, in Lancashire, the spread of small-pox was, in 1876, successfully checked by the isolation of a few first attacks. At Wigan, the isolation of a first imported case, both in 1877 and 1878, prevented any further attack. At Maidstone I found that there had never been any spread of small-pox in any house from which the medical officer of health succeeded in removing to hospital the first patient attacked. Indeed, it was everywhere found that where a hospital for the reception of infectious diseases was kept in actual readiness for the admission of patients, and where removal could be effected at the outset of the disease, the isolation of cases of small-pox had prevented any extension of infection."

Dr. Thorne says: "It is really more striking as regards small-pox than any other disease, because small-pox can be more easily isolated; the friends of the patient, and they themselves being so much more willing to submit to isolation, than when suffering from any of the other specific fevers." He adds, however, that "efficient vaccination must be considered as a probable influence in contributing to the results."

It is to be observed, too, that Dr. Thorne expressed the opinion that after an outbreak of small-pox had proceeded a certain way, the influence of a hospital for good upon the population would be very small indeed, that it would be good so far as concerned the individual house from which the patient was removed, but that it often had but little influence upon the general body of the epidemic.

469. After the hospitals established by the Metropolitan Asylums Board had been employed for some time for the reception of persons suffering from small-pox, attention was called to the fact that the number of cases of the disease in the neighbourhood of the hospitals was apparently in excess of the number found in streets further removed from them, and a suspicion was aroused that the hospitals were themselves causing a spread of the disease. There had appeared, according to Dr. Thorne, to be ground for believing that in the case of two provincial hospitals, one at Maidstone and the other at Stockton, the inhabitants of dwelling-houses in their neighbourhood had suffered owing to proximity to these institutions. In consequence of the suspicion which existed as to the influence of London hospitals in spreading the disease a careful investigation was made for the Local Government Board by Mr. Power of the circumstances relating to the Fulham small-pox hospital. In the result, he came to the conclusion that the Fulham hospital, with all its advantages of site and construction, and with the many excellences of its administration, had, by dissemination of small-pox material through the atmosphere, given rise to an exceptional prevalence of small-pox in its neighbourhood.



470. The matter was felt to be of so much importance that a Royal Commission was appointed to consider the prevention and control of epidemic infectious diseases in London and its neighbourhood.

The Commission arrived at the conclusion that it "appeared clearly established," by the experience of the five hospitals maintained by the Asylums Board for small-pox patients, that "by some means or other the asylum hospitals in their present shape "cause an increase of small-pox in their neighbourhoods." They accordingly recommended that these hospitals, which, in their judgment, should be no longer used to anything like the extent they then were for cases of small-pox, should become, in the main, fever hospitals, and that mild and convalescent cases of small-pox should be provided for in two or three more country hospitals, it being apparently thought impracticable to remove acute cases to such hospitals.

471. Towards the end of the year 1883 the Metropolitan Asylums Board, who had already made some use of a hospital camp at Darenth, and a hospital ship, the "Atlas," moored at Greenwich, for the treatment of small-pox patients, decided to make important changes in its method of dealing with London small-pox.

The "Atlas" hospital ship was moved to Long Reach, about 20 miles below London Bridge, and well without the metropolitan area, and re-opened in February 1884; the hospital camp at Darenth was re-opened early in the following month; in June of the same year a second hospital ship, the "Castalia," was opened alongside the "Atlas," and a second hospital camp opened at Darenth; and from February to October 1884 the cases of small-pox received by the Board were dealt with in the following manner: Cases of small-pox were received at first at three, and afterwards at six, intra-urban hospitals and there treated—(in May the hospitals at Hampstead and Fulham had been re-opened for this purpose and a sixth hospital hired at Plaistow, just beyond the metropolitan boundary but in a populous district)—but the number of cases under treatment in each intra-urban hospital at any one time was not allowed to exceed 50, mild and convalescent cases being thence transferred from time to time to the hospital ships and camps, where their treatment was continued; after the middle of June mild cases of small-pox were also received on the hospital ships directly from their homes. Complaints, however, again arose that some of the six intra-urban hospitals, and even that the hospital camps at Darenth, were spreading small-pox in their vicinity, legal proceedings being instituted with reference to the use of the latter; and from October 1884, though the Board continued for a time to follow the same method of dealing with cases of small-pox, but the number of cases under treatment in each intra-urban hospital at any one time was not allowed, as a rule, to exceed 25.

472. Finally, in July 1885, the Metropolitan Asylums Board decided thenceforward to treat, in the first instance, on the hospital ships, all cases of small-pox received by the Board, unless the condition of the patients made their removal to the ships dangerous; and the Board's arrangements, well designed and well carried out, for the conveyance of patients thereto, have since been found to admit of practically the whole of the cases being taken to the ships. As a relief to the hospital ships in times of small-pox epidemics, the Board erected in 1888-9, and extended in 1893-94, at Darenth, on a site near that before used for the hospital camps, a hospital primarily intended for cases convalescent after small-pox, which was so used during the later part of the small-pox outbreak of 1892-94. The Metropolitan Asylums Board have also provided, since 1881 a partial, and since 1889 a complete, ambulance service for London small-pox; and so well has the service, which formerly was often an undoubted means of infection, been carried on by the Board that it may, in this connexion at least, be taken that no spread of infection has occurred from the Board's ambulances.

473. In many of the large towns of England the notification of infectious diseases, including small-pox, has been at different times adopted, and steps have been taken to provide hospital accommodation where patients suffering from small-pox could be received, and endeavours made with more or less vigour to isolate cases of the disease by removing them to a hospital. We shall advert presently to the effect of these measures in the metropolis and some provincial towns. We may mention here, however, that the experience in London, that the collection of a considerable number of small-pox cases in hospitals situate in or near populous districts tends to a spread of the disease, has had its counterpart in provincial towns, though the greater numbers collected in one place have, we believe, made the evil more felt in London than elsewhere.



474. The reports upon recent provincial epidemics to which we have so often referred contain evidence bearing upon the danger of spreading the disease if considerable numbers of small-pox patients are aggregated in hospitals situate in populous neighbourhoods. Thus in Sheffield the Winter Street hospital appears to have led in the epidemic of 1887-88 to a dissemination of the disease in the vicinity. The site of the hospital has been since changed. Again at Leicester it was observed during the epidemic of 1892-93 that the amount of small-pox round the hospital was abnormally great when compared with the other parts of the town. And there was a similar experience at Warrington and other places.

475. As regards Scotland, the yearly abstracts of public health expenditure, given in the more recent reports of the Board of Supervision, enable us in some degree to judge of the extent to which local authorities have exercised the power to provide, or to join in providing, isolation hospitals for the use of the inhabitants of their districts, given to them by the Sanitary Act of 1866, and again by the Public Health (Scotland) Act of the following year. The earlier of those Acts, not having been framed with special reference to the local institutions of Scotland, was practically inoperative in that part of the United Kingdom, but some few local authorities may have from the first exercised their powers in this respect under the Act of 1867. The abstracts of expenditure given by the Board of Supervision do not enable us, however, specially to distinguish expenditure in connection with the provision, or maintenance of hospital accommodation incurred prior to the year ending the 14th May 1873. From that year onwards the proportion, year by year, of local authorities making any such expenditure, however small, is shown by the following table:—

| Year.                  | Proportion in each Year of Local Authorities making any Expenditure at all in connection with the Provision or Maintenance of Hospital Accommodation. | Year.                  | Proportion in each Year of Local Authorities making any Expenditure at all in connection with the Provision or Maintenance of Hospital Accommodation. |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ending 14th May 1873 - | 5 per cent.                                                                                                                                           | Ending 14th May 1884 - | 13 per cent.                                                                                                                                          |
| " " 1874 -             | 6 "                                                                                                                                                   | " " 1885 -             | 13 "                                                                                                                                                  |
| " " 1875 -             | 7 "                                                                                                                                                   | " " 1886 -             | 13 "                                                                                                                                                  |
| " " 1876 -             | 7 "                                                                                                                                                   | " " 1887 -             | 13 "                                                                                                                                                  |
| " " 1877 -             | 8 "                                                                                                                                                   | " " 1888 -             | 15 "                                                                                                                                                  |
| " " 1878 -             | 9 "                                                                                                                                                   | " " 1889 -             | 16 "                                                                                                                                                  |
| " " 1879 -             | 10 "                                                                                                                                                  | " " 1890 -             | 17 "                                                                                                                                                  |
| " " 1880 -             | 10 "                                                                                                                                                  | —                      | —                                                                                                                                                     |
| " " 1881 -             | 11 "                                                                                                                                                  | " " 1891 -             | 34 "                                                                                                                                                  |
| " " 1882 -             | 12 "                                                                                                                                                  | " " 1892 -             | 39 "                                                                                                                                                  |
| " " 1883 -             | 12 "                                                                                                                                                  | " " 1893 -             | 44 "                                                                                                                                                  |
|                        |                                                                                                                                                       | " " 1894 -             | 49 "                                                                                                                                                  |

476. The largely increased proportion of local authorities making some expenditure in connection with the provision or maintenance of hospital accommodation during the year ending the 14th May 1891, as compared with the proportion in the previous year, probably does not indicate any material increase in the amount of hospital accommodation provided. At the beginning of that year (*i.e.*, in May 1890), under the provisions of the Local Government (Scotland) Act of 1889, there were substituted for certain of the local authorities under the Public Health (Scotland) Act of 1867 a very much smaller body of authorities, representing larger areas in which the districts of the former authorities were merged. Apart, therefore, from any increase which may have followed in the amount of hospital accommodation provided, the effect was naturally to increase the proportion of local authorities making some expenditure in connexion with the maintenance of hospital accommodation.

At the same time the success, in this respect, at all events, of the policy of this substitution, is strikingly shown by the increased proportion of local authorities making some expenditure in connection with the provision or maintenance of hospital accommodation during the year ending the 14th May 1892, and during each of the two following years, as compared with the proportion during the year ending the 14th May 1891.

477. In the case of Ireland, we are able to judge to some extent of the proportion of cases of small-pox which, prior to the enactment of the Sanitary Act of 1866, was



treated in hospitals or infirmaries of some sort. The inquiries, to which we have already referred, made on the taking of the census in 1841, in 1851, in 1861, and in 1871 gave the following results:—[Census reports of Ireland: in 1841, pp. xii, xiii, lix, and lx, and pp. 182 and 194–204 of Surgeon Wilde's Report; in 1851, part v., vol. i., pp. 364–5 and 423, and vol. ii., pp. 70, 110, and 122; in 1861, part iii., vol. ii., p. 20, and (in the tables) pp. 66, 106, and 118; and in 1871, part ii., vol. ii., pp. xxxvii, 122, 154, 168, and 256.]

58,006 persons were returned as having died of small-pox during the inter-censal period 1831–41. Of these 58,006 deaths, 19 occurred in the few Poor Law institutions which had been opened towards the close of the period; 16 occurred in county hospitals; 5 in prison hospitals; 38 in other general hospitals; and 49 in fever hospitals. So that altogether 127 out of the 58,006 deaths (or 0·2 per cent.) occurred in these institutions.

38,275 persons were returned as having died of small-pox during the inter-censal period 1841–1851. Of these 38,275 deaths, 5,016 (or 13·1 per cent.) occurred in Poor Law institutions; 8 occurred in county hospitals; 4 in prison hospitals; 26 in other general hospitals; and 593 in fever hospitals. So that altogether 5,647 out of the 38,275 deaths (or 14·7 per cent.) occurred in these institutions.

12,727 persons were returned as having died of small-pox during the inter-censal period of 1851–61. Of these 12,727 deaths, 1,118 (or 8·8 per cent.) occurred in Poor Law institutions; 4 occurred in county hospitals; 9 in prison hospitals; 57 in other general hospitals; and 187 in fever hospitals. So that altogether 1,375 out of the 12,727 deaths (or 10·8 per cent.) occurred in these institutions.

4,113 persons were returned as having died of small-pox during the inter-censal period 1861–71. Of these 4,113 deaths, 435 (or 10·6 per cent.) occurred in Poor Law institutions; 2 occurred in county hospitals; none in prison hospitals; 22 in other general hospitals; and 107 in fever hospitals. So that altogether 566 out of the 4,113 deaths (or 13·8 per cent.) occurred in these institutions.

478. The figures just given relate to deaths from small-pox only and not to all cases of that disease however terminating. But unless the rate of fatality during the periods to which they relate was considerably lower amongst cases of small-pox treated in the institutions mentioned than amongst cases treated outside, which is unlikely to have been the case, we may infer from the figures that in Ireland the proportion of cases of small-pox which were treated in hospitals or infirmaries of some sort did not materially exceed 0·2 per cent. during the inter-censal period 1831–41, 14·7 per cent. during the inter-censal period 1841–51, 10·8 per cent. during the inter-censal period 1851–61, and 13·8 per cent. during the inter-censal period 1861–71. It must not, of course, be assumed that the cases so treated were effectually isolated during their treatment.

479. We have not the same means of estimating the proportion of cases of small-pox in Ireland which have been treated in hospitals or infirmaries of some sort since the close of the inter-censal period 1861–71. The power, given to local authorities by the Sanitary Act of 1866 and again by the Public Health (Ireland) Act of 1878, to provide, or to join in providing, isolation hospitals for the use of the inhabitants of their districts, has been exercised in Ireland to a far less extent than the similar power in England and Scotland; indeed, except in the case of some few towns in quite recent years, it can scarcely be said to have been exercised at all. On the other hand such isolation of cases of small-pox as may have been effected by their treatment in Poor Law institutions was carried out more generally in Ireland during the decennial period 1871–80 than during any of the inter-censal periods to which we have referred, and still more generally and indeed to a very large extent during the next decennium 1881–90. The returns of deaths in workhouses from small-pox, given in the annual reports of the Local Government Board for Ireland, show that the proportion of the deaths from small-pox in Ireland which occurred in those institutions was about 25 per cent. during the period 1871–80, and about 65 per cent. during the period 1881–90. Unless, therefore, the rate of fatality during these periods amongst cases of small-pox treated in those institutions was materially different from the rate of fatality amongst cases treated outside, it would appear that about one case of small-pox out of every four during the period 1871–80, and about two cases out of every three during the period 1881–90, were treated in Poor Law institutions.

480. Passing now to a consideration of the effect produced by a notification of cases of small-pox and the steps taken to isolate them, we naturally begin with Leicester.



The method there employed in dealing with small-pox has attracted much attention, and is often spoken of as the "Leicester system."

As some discussion has arisen as to the exact procedure under the Leicester system, it will be well to briefly state in what it consists. On the receipt of a notification at the Health Office, a telephonic message is sent to the hospital to prepare for the reception of a patient, and to despatch the ambulance; the sanitary inspector at once proceeds to the house notified, and urges the removal of the patient to hospital, and also the removal of those who have been in contact with him to the quarantine wards near the hospital. There is rarely any difficulty in securing the removal of the patient; in the case of the other inmates of the infected house, there is no power of compulsory removal, but persuasion has generally been successful. If a person liable to infection is not quarantined, he is visited daily by the inspector; he is warned against going to work, or undue exposure, but is not confined to the house. Compensation has been given in some cases. The history of the small-pox patient is then inquired into, especially his whereabouts, and the persons he has been in contact with during the preceding fortnight, and any clue of infection is vigilantly followed up. Meanwhile, the house is thoroughly disinfected, and clothing is either burnt or sent to the steam disinfector on the hospital grounds. There are 28 beds ordinarily set aside for small-pox in a separate pavilion at the hospital; in another building, fenced off from this but very near it, cases of scarlet fever are received, and the quarantine wards are separated from the fever wards by a corridor only.

If no small-pox appears among those quarantined, they are allowed to return after 14 days; vaccination or re-vaccination is offered them, but it has not been largely accepted. From 1877 to 1891 inclusive it appears that 183 persons were thus quarantined, and 103 patients were treated in the small-pox hospital. Of 14 persons quarantined in 1887 two developed small-pox, and of 39 quarantined in 1888 three developed small-pox.

481. Leicester suffered severely from small-pox in 1872, 346 deaths having been registered as caused by it. Two deaths from that disease occurred in 1873, but no other until 1877, when there were six, and one in the following year. The next year in which small-pox deaths were registered was 1881. There were two in that year and five and three in the following years. No other death took place until 1892 and 1893, in which years the fatal cases numbered 21.

Prior to 1875 the vaccination laws were well observed in Leicester. In that year the number of children born who were unaccounted for was only some 4 per cent. Since then there has been, as we have seen, a marked and progressive decline in the number of vaccinations, especially since 1883, until at the present time 80 per cent. of the children born remain unvaccinated.

482. The borough hospital for infectious diseases was erected in 1871-2 outside the town; though within the last few years houses have been built in proximity to it. It appears to have been with Dr. Crane, the Medical Officer of Health in 1875, that the quarantining the inmates of an infected house, in addition to isolating the patient, originated. His successor, Dr. Johnston, established it in 1877 as a regular system. He was aided in this, after 1879, by the notification of infectious diseases then rendered compulsory by a private Act which Leicester, anticipating most other towns, obtained in that year. Dr. Johnston reported that up to 1884 the spread of small-pox from imported cases had been arrested in 20 instances by the means he adopted.

His successor, Dr. Tomkins, though, like his predecessors, regretting the increasing disuse of vaccination, bore testimony in his annual reports to the efficacy of the measures adopted in Leicester, and expressed his opinion that had such a system been in force at Sheffield in 1887 it would not have suffered in the way it did.

483. In 1892 small-pox became prevalent in different parts of England, especially in Lancashire and Yorkshire. Many of the large provincial towns suffered, and Leicester amongst them. There were in 1892-3, 357 cases of small-pox in Leicester, of whom 21, or 5·8 died. 193 households were invaded, containing 1,234 persons. The first importation was by a tramp, whose disease, passing unrecognised, caused infection at a common lodging-house and at the workhouse. 11 other importations of the disease by tramps occurred in the course of 1892-3. When the first cases were removed to the hospital the fever wards were full of children suffering from scarlatina, and others, convalescent from that disease, were lodged in a neighbouring pavilion. It is not surprising that a number, amounting in all to 13, of the scarlatinal children caught



small-pox, some of these apparently from contact with a child who, during quarantine, developed a scarlatinal rash, and later an eruption, which was at first erroneously thought to be chicken-pox. The children from the fever wards were sent home in October 1892, but six of them were re-admitted to hospital with small-pox within a fortnight. From this time onward the whole of the hospital was devoted to small-pox cases, and to quarantined persons. It was, however, soon found impossible, for lack of accommodation, to remove all the inmates of the infected houses to the quarantine wards at the hospital; and from May 1893 onwards, quarantine was superseded by a system of daily visitation and inquiry.

484. An analytical study of the incidence of small-pox on 193 households, containing 1,234 inhabitants, shows that in the 170 instances in which the first or only case of small-pox was removed to hospital, 85 cases occurred among the 915 other inmates, or 9·2 per cent. In the 23 instances in which the first or only case of small-pox remained at home, 42 cases occurred among the 126 other inmates, or 33·3 per cent. Both in the vaccinated and the unvaccinated a far greater proportion of the inmates were attacked when the first case remained at home than when removed to hospital.

The influence of promptitude in removal upon the development of secondary cases is shown by the following facts. In 120 of the 170 houses from which the first or only case of small-pox was removed, there were no further cases. Removal had been effected on or before the fifth day of attack in 60 per cent. of the cases so removed. In the remaining 50 houses out of the 170, one or more further cases of small-pox occurred. Removal had been effected on or before the fifth day in only 38 per cent. of the first cases occurring in these houses.

485. The evidence derived from the complex conditions which obtained at Leicester during the outbreak of 1892-3, is inconclusive as to the relative merits of quarantine in hospital or supervision of the exposed at their homes. The influence of prompt isolation of the patient appears to overshadow any superior efficacy the one method may have had over the other.

486. Leicester suffered less than many of the other large towns which have been invaded by small-pox during recent years, both in the number of cases and in the number of deaths. In connexion with this, however, a point to which we have already called attention must be borne in mind. The disease was remarkably slight there in its fatality, even as regards those who, by reason of their age, could not be affected by the change of practice in relation to vaccination. Dr. Priestley, the Medical Officer of Health, claims, in his report to the Sanitary Committee for 1893, that it was by reason of the energetic methods adopted that the disease had been prevented running riot through the town. His claim may be well-founded. At all events, the experience of Leicester affords cogent evidence that the vigilant and prompt application of isolation, &c., even with the defects which were brought to light during the recent epidemic, is a most powerful agent in limiting the spread of small-pox. It is true that the system and appliances which appeared adequate for some years failed to prevent a serious outbreak of small-pox in 1892-3. We think its value was none the less real. We shall consider the matter further when we come to review the whole of the evidence on the subject of isolation and notification.

487. The system of isolation has been adopted more or less completely in many provincial towns, and has there proved of value.

At Sheffield, during the epidemic of 1887-8, there was no compulsory notification, though a voluntary system of notification by medical men had been in vogue since 1885. Only one-fourth of the 32 cases of small-pox known to have occurred during the first three months of the epidemic were thus notified. Though the proportion of notified cases increased as the epidemic progressed, it is evident that during the most important period the system must be regarded as having failed. The borough hospital in Winter Street, which for a considerable period was the only hospital in use, did not provide adequate accommodation for patients, and became overcrowded; moreover, being in proximity to a densely populated area, it became the means of spreading the disease. Cases of small-pox were accordingly treated in buildings or huts in connexion with the Sheffield and Eccleshall Unions' Workhouses, and the disease spread to inmates of the workhouses. Nevertheless, evidence is forthcoming from Sheffield of the great advantage to individual households of early removal of first cases. Dr. Barry says:—

“The advantages arising to individual households from the early removal of small-pox cases to hospitals were clearly seen in the earlier months of the epidemic.



" From its commencement to the middle of July, during which period, with comparatively few exceptions, all cases of small-pox which came to the knowledge of the Health Department were at once removed to hospital, it was exceptional to have a recurrence of the disease in the same household. After the middle of July, in consequence of the insufficiency of hospital accommodation, a large and increasing proportion of small-pox cases had to be treated in their own homes, and multiple cases in families became of frequent occurrence.

" The beneficial effect upon groups of households and districts of the early removal of cases to hospital is evident from the following notes with regard to the sub-districts of South Sheffield, Attercliffe, and Upper Hallam, all districts at a considerable distance from the hospital.

" Small-pox was introduced into South Sheffield in July, during which month two persons living in different houses contracted the disease. Both cases were at once removed to hospital. During August two more houses were invaded, and the cases were similarly dealt with. No fresh cases occurred in this district till October, when the disease was again introduced, and in consequence of the want of accommodation in the hospitals, cases had to be treated at home. During this month 25 households were attacked, and from this time onwards the number of fresh households affected rapidly increased.

" Small-pox was introduced into Attercliffe in the third week in July, and the person who had contracted the disease was at once removed to hospital. No further case occurred in this district until in the fourth week in August a house situated in a different part of the district to that last mentioned became affected. In consequence of the want of accommodation in the hospital it was two or three days after the development of the disease before this case could be removed, and in the following fortnight six new cases occurred, of which three were in the same house as the person above referred to. Of the three cases in fresh houses two were removed to hospital and one was treated at home. In the following fortnight two fresh houses in the same neighbourhood were invaded, and from this time cases occurred more frequently. In October there were 11 new cases, in November 24, in December 67, in January 1888, 140, in February 150, and in March 170, only a small proportion of these later cases being removed to hospital.

" In Upper Hallam the first case of small-pox was reported to have occurred on June 18th. This was at once removed to hospital, as was also a second case which occurred on July 1st. No further cases were reported to have occurred in this district till September 20th, when there was a case which was also at once removed to hospital. From that date till December 29th, when the disease was re-introduced, no more were reported to have occurred in the district."

The experience gained in 1887-8 has borne fruit; in 1889 Sheffield adopted the Compulsory Notification Act, and when small-pox broke out there in 1892-3 all cases were promptly removed to the new hospital at Lodge Moor, four miles from the centre of the town and in an isolated position. So convinced is the medical officer of the need for isolating those attacked that he is in favour of insisting on removal in any case. Moreover, provision has been made at Lodge Moor for isolating members of infected families, or others who have been exposed to infection and quarantining them for 15 days. 18 persons were thus quarantined in the outbreak of 1892-3. To these measures and to the influence of the epidemic of 1887-8, when 6,088 persons suffered from small-pox, of whom 589 died, as well as to the numerous cases of re-vaccination, is ascribed the non-extension of the disease in 1892-3. Sheffield had obeyed the vaccination laws better even than the average of large towns. Had there been prompt removal of first cases to adequate and suitable hospital accommodation in 1887, it is in the highest degree improbable that the disease would have run riot as it did. It is important to notice that the rapid spread of the disease at the commencement of the epidemic of 1887-8 seems to have been due to the fact that some of the early cases were of so mild a character that they passed unobserved.

488. At Halifax in 1893, owing to inadequacy of accommodation, an attempted quarantine of infected households at the hospital broke down, the disease was spread from common lodging houses, and invaded the poorer portions of the town, and was especially prevalent in the neighbourhood of the small-pox hospital.

489. At Bradford the fever hospital has on many occasions since 1874 afforded isolation for small-pox cases, and effectually prevented its spread in the borough. It was formerly in an isolated situation, but houses have now been built close to the walls



of the hospital grounds, and in these there was a special incidence of the disease in 1893. Owing to the prevalence of scarlet fever, the accommodation for small-pox proved inadequate, and a temporary hospital was erected at Scholemore. Unfortunately a fire broke out here in October 1893, necessitating the removal of the patients, and causing a further extension of the disease as well as seriously dislocating hospital isolation. Quarantining was only attempted on a small scale at Bradford, in a house accommodating four persons.

490. Without entering into further details, we may state that the advantage of hospital isolation has been felt in Glasgow, Leeds, and other towns.

491. We have already directed attention to the fact that it was practically speaking not until 1871 that hospital accommodation was provided in London, which rendered possible the removal from their homes of persons suffering from small-pox, and we have detailed the measures adopted from time to time for that purpose.

As these facilities were augmented, the proportion of cases treated in the Metropolitan Asylums Board's hospitals steadily increased:—

| Years.       | Number of Deaths from Small-pox registered in London, or (of London Residents) in the Metropolitan Asylums Board's Hospitals situated outside London. | Number of Deaths from Small-pox in the Metropolitan Asylums Board's Hospitals. | Deaths in Metropolitan Asylums Board's Hospitals—Per Cent. of Total Deaths. |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1871-2 - - - | 9,643                                                                                                                                                 | 3,020                                                                          | 31                                                                          |
| 1881 - - -   | 2,373                                                                                                                                                 | 1,431                                                                          | 60                                                                          |
| 1893 - - -   | 206                                                                                                                                                   | 180                                                                            | 87                                                                          |

The deaths shown by the table in the last of these years are not those which occurred in the hospitals during that year, but the deaths of patients who during that year were admitted to the hospitals. This does not, however, detract from the importance of the figures as evidence of the great increase in the proportion of small-pox cases treated in the hospitals.

492. The Royal Commission to which we have referred, in their Report made in July 1882, contrasted the amount of small-pox in London with that which had occurred in England generally. It will be well to bring such a comparison down to the present time and to notice the features which it presents.

The following table affords a comparison between the mortality in London and that in England and Wales with the metropolis excluded, the deaths being those from small-pox to every 100,000 living. The figures are taken for the five years 1838-2, and from 1847 onwards in decennial periods, the figures for the years 1843-6 not being procurable.

|               | Mean annual Deaths from Small-pox to every 100,000 living. |         |
|---------------|------------------------------------------------------------|---------|
|               | England and Wales, excluding London.                       | London. |
| 1838-42 - - - | 54·5                                                       | 77·1    |
| 1847-56 - - - | 23·6                                                       | 34·6    |
| 1857-66 - - - | 20·0                                                       | 26·8    |
| 1867-76 - - - | 22·5                                                       | 41·9    |
| 1877-86 - - - | 3·3                                                        | 27·4    |

493. It will be seen that during the second and third periods, there was a great reduction of mortality both in England, excluding the metropolis, and in London; though it must be remembered that 1838-42 includes 1838, in which there was a considerable epidemic. The great epidemic wave of small-pox which swept over the country in 1870-1, and which made itself felt in almost every part of Europe, naturally produced a sensible effect on



the mortality of the next decennium, but it is to be noted that its effect was much more serious in London than outside the metropolis. The mortality there, though raised higher than in the previous decennium, did not reach the point at which it stood in the decennium before that. In London, on the other hand, the mortality largely exceeded that of the two previous decennia. Again it is to be observed that though in the next decennium the mortality fell, both in England generally and in the metropolis, the fall was very different in its extent; outside the metropolis it was vastly greater than within it. It is only since the year 1885 that the condition of London has been at all comparable as regards the amount of small-pox mortality with the rest of the country. The corresponding figures for the years 1887-94 to those given above are as follows:—

|         | England and Wales,<br>excluding London. | London. |
|---------|-----------------------------------------|---------|
| 1887-94 | 2.0                                     | 1.0     |

494. In the Report of the Royal Commission of 1881, already alluded to, suggestions were made with regard to notification and isolation which have since been largely carried into effect. As we have said, it was considered proved that the existing small-pox hospitals had caused a spread of the disease in their neighbourhood. We cannot but think that this may in some measure account for the greatly increased mortality from small-pox in London during the 1871-72 epidemic as compared with the rest of the country. It is true that the statistics relating to England and Wales outside the metropolis include those of other large towns where the same evil was present, but it probably did not exist then in so aggravated a form, and the effect may be neutralised by the statistics relating to smaller towns and rural districts with which they are combined. This idea has been suggested to us, as the result of the inquiry, how it has come about that whilst the metropolis, in the decennium 1867-1876 and again down to 1885, compared so unfavourably with the rest of the country, the condition has since that date become so entirely changed? We think it is impossible to attribute this change to vaccination. There is no reason to suppose that the position of the metropolis in respect to vaccination has, since the year 1885, become superior to the rest of England and Wales; rather the other way, as the decrease in infantile vaccination has been greater during the last few years than in the rest of England and Wales. The change, therefore, must be due to some other cause.

495. The hospitals which, in the opinion of the Commissioners, were propagating the disease in their neighbourhood, were in operation down to July 1882, when their Report was made. In 1877 and 1878 and again in 1881, small-pox was epidemic in London to a considerable extent.

We have stated in detail in paragraph 471 the steps which were taken by the Metropolitan Asylums Board in consequence of the recommendations of the Royal Commission. It will be seen that the intra-urban hospitals still continued in use, and that complaints were made in 1884 that they were spreading small-pox in their vicinity, although the number in each of them was not allowed to exceed 50. In October 1884 this number was reduced to 25. It was not, however, until 1885 that the system, now in operation, was inaugurated, and all cases of small-pox were treated in hospital ships. It is impossible not to be struck with the fact that it is, since the year 1885, that the metropolis has presented so satisfactory an aspect as regards small-pox mortality. The facts to which we have been calling attention certainly seem to point to the conclusion that this has been due to a system of isolation, well organised and administered, the beneficial effect of which is no longer neutralised by a spread of the disease from the hospitals in which the isolation is carried out.

Upon the whole, we think the experience of London affords cogent evidence of the value of a sound system of isolation in checking the spread of small-pox.

496. The experience of isolation systems in Australia is interesting and worthy of special notice, because whilst in this country the quarantining of persons who have come in immediate contact with those suffering from small-pox has only been possible with the consent of the persons whom it was proposed to subject to quarantine, in Australia their removal to a place of isolation has been made compulsory.



497. Australia, by virtue of its geographical position, and the consequent separation by long sea voyage from infected ports, enjoyed for a long time a sort of natural isolation. Thus, Hirsch, in his "Historical and Geographical Pathology," Vol. I., pp. 133-4 (1881), remarks:—

"The continent of Australia up to 1838 had enjoyed an absolute immunity from small-pox; towards the end of that year [the disease appeared at Sydney, having been imported probably from China; it lasted, however, only a short time, and remained absent from the continent until 1868. In that year it was introduced into Melbourne by a ship, and again it spread only to a slight extent, and quickly died out. By a rigorous inspection of ships on their arrival, it has been found possible to prevent subsequent importations, a notable instance of prevention having occurred in 1872. Tasmania has hitherto quite escaped the disease; so also has New Zealand, where an importation of it in 1872 was prevented by strictly isolating a vessel that had arrived with small-pox on board."

In New South Wales, Dr. MacLaurin, who has been President of the Board of Health since 1889, informed us that the Government act on the assumption that small-pox is an exotic disease, and that every case must have come from outside the colony, and it is therefore dealt with under a quarantine Act of William IV., originally instituted for dealing with cholera. By an Act passed in 1882, notification of small-pox was made compulsory on medical men and householders under heavy penalties. At Sydney notification of small-pox is followed up by the compulsory removal of the patient and all persons who have been in the house with the patient to the quarantine station at North Head. This station is 670 acres in extent, and situated on the peninsula at the mouth of Sydney Harbour, and is seven miles from the Health Office, with which there is telephonic and telegraphic communication. The persons are conveyed to the station by a steamboat comfortably fitted expressly for the purpose, and no difficulty has been experienced in effecting their removal. It was, in Dr. MacLaurin's opinion, by carrying out this practice of isolation and quarantine that "the epidemic of 1881-82 was suppressed," and small-pox "has never become epidemic since this plan has been adopted." The persons who have been in the house with the patient are detained 21 days in quarantine from the date of the last possible contagion. Should a case of small-pox arise among them, those who had been in contact with such infected person would be detained for a further period of 21 days, and so on. To facilitate this the exposed persons are distributed in separate groups within the station. They are allowed to receive letters or parcels, &c., and a telegraph operator is employed, "whose special business it is to work the telegraph at their request." "Reasonable compensation is given by the Government for loss;" and there are heavy penalties under the original Act whereby the quarantine is secured. The station is, according to Dr. MacLaurin, "a pleasant place to stay in, and everything is done that can be done to make the people comfortable; they have nothing whatever to do, and are free from all care, and they can spend the day pleasantly enough; but they do not like it." No one, however, raises any objection to the Sydney system; "the people are all very sensible about it." In all Australian towns the same system is carried out as strictly, with the result that there was not a case of small-pox in Australia on the 5th February 1890; and Dr. MacLaurin is of opinion that the risk of dying of small-pox in Australia is smaller than in any other part of the world. As regards vaccination:—In New South Wales it is very little practised; there is no compulsory Act; and though medical opinion is in favour of it, an opinion shared by Dr. MacLaurin, it is not likely that a compulsory Vaccination Act could be passed or would be tolerated. The proportion of young persons in New South Wales who are not vaccinated is accordingly very large; probably much more than half of those under ten years of age are unvaccinated. Although Dr. MacLaurin favours vaccination and respects it highly, he is satisfied that the system of isolation as supervised by him is perfectly successful. As President of the Board of Health he considered it his business to produce extinction of the disease; he does not consider vaccination a sufficiently absolute protection for such purpose; and he is "fully of opinion that the only way in which you can bring to an end an outbreak of small-pox, that is to say, to bring it under control, and not leave it to work itself out, is by notification and isolation. Of course in any small community, if you let the disease in it will work itself out in time, because all the susceptible people will have had it; but the only way in which you can absolutely control an epidemic of small-pox is by a system of notification and isolation."

498. Small-pox has never been epidemic in Western Australia. Only one case has occurred within the last 31 years, and that was an imported one; quarantine was



carried out and no infection occurred; the immunity from the disease is mainly at least due to isolation. Before 1879 vaccination was not generally practised, a great majority of those born in the colony were unvaccinated; in that year a compulsory Vaccination Act was passed in consequence of Sir H. Ord and Dr. Waylen's representations, and in consequence of reports of small-pox in other colonies, and not on account of the existence of small-pox in Western Australia.

In Tasmania there was a compulsory vaccination law, but it was found to be inoperative because no one was appointed to conduct the prosecutions, and it has now fallen into desuetude. The same system of isolation and quarantine is exercised as in the other Australian colonies. Small-pox was for the first time introduced into Tasmania in 1887, and although preparations for isolation were inadequate, the disease was soon stamped out. Communication between Launceston and Melbourne was temporarily suspended, and to this precaution the non-invasion of Victoria was attributed. The particulars of this, the first introduction of small-pox into Tasmania during the history of that colony, are to be found in a report to the Central Board of Health by Mr. A. Mault, dated November 17, 1887. The origin of the outbreak is not clear, but it was presumed to have been imported, probably by a ship from China, into Launceston. The earliest case reported to the Local Board of Health was on September 23, though it appears that earlier cases had passed unnoticed, or had been notified as measles. 33 cases in all occurred, every one of which was traced to direct infection to the first case. By September 27 a temporary hospital had been erected, and thither patients and suspects to the number of 72 were removed. The last case appeared on October 13. Other persons who had been to the infected houses were isolated in their houses and watched. Only four of the 47 persons quarantined at the station were attacked. The clothing was burnt, and very thorough disinfection of the infected houses was carried out, and the dead were interred in a special cemetery. The other colonies were communicated with, and quarantine, at first unduly rigid, and afterwards relaxed, was practised against ships proceeding from Tasmania. Although vaccination had been nominally compulsory in Tasmania, it was estimated that two-fifths of the population were unvaccinated.

499. We have no difficulty in answering the question, what means other than vaccination can be used for diminishing the prevalence of small-pox?—We think that a complete system of notification of the disease, accompanied by an immediate hospital isolation of the persons attacked, together with a careful supervision, or, if possible, isolation for sixteen days of those who had been in immediate contact with them, could not but be of very high value in diminishing the prevalence of small-pox. It would be necessary, however, to bear constantly in mind as two conditions of success, first, that no considerable number of small-pox patients should ever be kept together in a hospital situate in a populous neighbourhood, and secondly, that the ambulance arrangement should be organised with scrupulous care. If these conditions were not fulfilled, the effect might be to neutralise or even do more than counteract the benefits otherwise flowing from a scheme of isolation.

500. When we turn to the other branch of the inquiry, how far such means could be relied on in the place of vaccination, we find ourselves involved in questions of a much more complicated nature. We have little or no experience to fall back upon. The experiment has never been tried. The nearest approach to a trial of it has probably been in Australia. But even in the parts of that country to which we have alluded the population has not been entirely unvaccinated, though there has been a large unvaccinated class amongst it. Moreover, in applying the experience of Australia to this country two things must be borne in mind. In the first place small-pox has only appeared from time to time, introduced from without at one or other of the ports of the country, and the several colonies of which Australia is composed are of great territorial extent, with few large centres of population. In this country small-pox is always present in some part of it. There has not been a single year without several deaths from the disease. Large centres of population are numerous, and the intercourse between them constant. In the several colonies of Australia the number of ports is not great, the vessels which enter them are comparatively speaking not numerous, and the ports from which they arrive are many days' voyage distant; and there are careful arrangements for quarantining vessels to exclude disease. The shipping which enters English ports is of vast quantity, and passengers are brought in large numbers from the continent of Europe not only daily, but it may almost be said hourly; the voyage, too, is but brief. The other matter to be



remembered, is that part of the Australian system is the *compulsory* removal to quarantine for 21 days of those who have been in the house with the patient, in addition to the transfer of the patient himself to a hospital. There can be no doubt that such a system, if completely carried out, would be of the highest efficacy. But it is obvious that in this country the practical difficulties of working such a scheme in the large towns would be really insuperable, to say nothing of the difficulty of procuring legislative sanction for it.

501. In order to maintain in efficiency the primary essential condition of a system of isolation, viz., the immediate isolation of a person attacked by the disease, it is requisite to have a hospital always ready with sufficient accommodation for the reception of all such cases, and there are no means of estimating what extent of accommodation will suffice to meet at all times the necessities of a particular town. It is certain that the disease spreads more rapidly, its contagion seems to operate more actively, at one time than at another. If an epidemic affects a locality, the preparations made for the isolation of small-pox cases, which have proved to be fully adequate in ordinary years, may turn out to be quite inadequate. It is impossible at once to provide the needed hospital accommodation. If the cases are to be removed to a hospital at all, the massing of large numbers together, in itself a means of spreading the disease, might prove inevitable. We have only to look at what happened at Leicester to see how suddenly the necessities of the case may outrun the preparations made for isolation. Moreover, although the vaccination of children had been neglected in Leicester for many years, it would be quite a mistake to regard it as an unvaccinated town. The population over 20 years of age were probably well-vaccinated, and a large proportion of those between 10 and 20 years of age were vaccinated persons. More than half even of those between 7 and 10 years of age at the commencement of the epidemic must be placed in the same category.

502. The question we are now discussing must, of course, be argued on the hypothesis that vaccination affords protection against small-pox. Who can possibly say that if the disease once entered a town, the population of which was entirely or almost entirely unprotected, it would not spread with a rapidity of which we have in recent times had no experience, or who can foretell what call might then be made on hospital accommodation if all those attacked by the disease were to be isolated? *A priori* reasoning on such a question is of little or no value.

503. We can see nothing then to warrant the conclusion that in this country vaccination might safely be abandoned, and replaced by a system of isolation. If such a change were made in our method of dealing with small-pox, and that which had been substituted for vaccination proved ineffectual to prevent the spread of the disease (it is not suggested that it could diminish its severity in those attacked), it is impossible to contemplate the consequences without dismay.

To avoid misunderstanding, it may be well to repeat that we are very far from underrating the value of a system of isolation. We have already dwelt upon its importance. But what it can accomplish as an auxiliary to vaccination is one thing whether it can be relied on in its stead is quite another thing.

504. Even admitting fully the protective effect of vaccination it does not, in our opinion, diminish the importance of measures of isolation or dispense with their necessity. We think that steps should be taken to secure a more general provision for the isolation of small-pox patients than exists at present. We have already called attention to the fact that mischievous results are likely to follow the use as a small-pox hospital of a building situate in a populous place. We think that wherever it is placed it should have sufficient space around it to enable the Sanitary Authority to add rapidly to the accommodation by the erection of temporary buildings.

505. Sanitary Authorities are now sometimes reluctant to provide isolation hospitals. We think that, on a petition by a prescribed number of the ratepayers in a sanitary district, the Local Government Board, if satisfied that hospital accommodation ought to be provided, should have power to make an Order for such provision.

506. Power should, in our opinion, be conferred on Sanitary Authorities to give compensation for loss of wages, and generally for any expenses occasioned either by the isolation of patients, or persons who have come in contact with them, or such supervision of them as is necessary, whether in hospital or elsewhere.



507. Our attention has been drawn to the circumstance that outbreaks of small-pox have not unfrequently had their origin in the introduction of the disease to common lodging-houses by tramps wandering from place to place. In view of this we make the following recommendations:—

- (i.) That common shelters which are not now subject to the law relating to common lodging-houses should be made subject to such law.
- (ii.) That there should be power to the local authority to require medical examination of all persons entering common lodging-houses and casual wards to see if they are suffering from small-pox, and to offer a reward for prompt information of the presence of the disease.
- (iii.) That the local authority should have power to order the keeper of a common lodging-house in which there has been small-pox to refuse fresh admissions for such time as may be required by the authority.
- (iv.) That the local authority should be empowered to require the temporary closing of any common lodging-house in which small pox has occurred.
- (v.) That the local authority should have power to offer free lodgings to any inmate of a common lodging-house or casual ward who may reasonably be suspected of being liable to convey small-pox.
- (vi.) That the Sanitary Authority should give notice to all adjoining Sanitary Authorities of the occurrence of small-pox in common lodging-houses or casual wards.
- (vii.) That where the disease occurs the Public Vaccinator or the Medical Officer of Health should attend and vaccinate the inmates of such lodging-houses or wards, except such as should be unwilling to submit themselves to the operation.

508. In connexion with the subject with which we have been dealing we may advert to the suggestion that the vaccination and the sanitary authority should in all cases be identical. It has been pointed out that whilst the isolation of patients in hospitals and otherwise is provided for by the sanitary authority the extent of the provision requisite to deal with the outbreak of an epidemic of small-pox may depend upon the degree in which the vaccination laws have been enforced. More hospital accommodation may be required where vaccination has been neglected than where the vaccination laws have been complied with. It is contended that sanitation and vaccination, concerning as they both do the health of the people, should be under the jurisdiction of a single authority, and that the sanitary authority is the appropriate one for that purpose. Indeed the advantage of placing in the same hands the supervision of vaccination and of the other measures designed to prevent the spread of disease are so great and so obvious that the proposal to do so deserves most serious consideration. Under present arrangements, however, such a proposal raises very great difficulties. Whilst in England and Wales there are only 648 vaccination authorities, the sanitary authorities exceed 1,700 in number. Moreover, whereas in some cases a borough (the council of which is the sanitary authority) comprises parts of several unions, in other cases a single union contains within it many sanitary authorities. For example, the Borough of Bristol includes the whole of one union and parts of two other unions. On the other hand the Huddersfield and Halifax unions contain no less than 25 and 19 urban sanitary districts respectively. Many other instances might be cited to show that it would be impracticable to vest the sanitary and vaccination duties in all cases in a single local authority without a complete recasting of our present areas of local administration. We are not in a position to devise a scheme which would accomplish either wholly or partially the desired result. At the same time we fully recognise the importance of achieving it as far as possible and we should regard with favour such changes as would render the amalgamation of the vaccination and sanitary authorities feasible, or indeed any steps taken in that direction even although they should only partially effect the object in view.

(E.) *As to whether any alterations should be made in the arrangements and proceedings for securing the performance of vaccinations, and, in particular, in those provisions of the Vaccination Acts with respect to prosecutions for non-compliance with the Law.*

509. From the views which we have expressed on the subject of vaccination, and on the absence of proof that any practical alternative exists which could be relied on to accomplish the same results if vaccination fell into disuse, it follows that we are of opinion that the State ought to continue to promote the vaccination of the people.



Nor are we prepared to recommend that the State should cease to require vaccination, and trust entirely to a voluntary adoption of the practice.

510. It will be well at the outset of our discussion of this subject to advert to the nature of the compulsion at present employed, to secure compliance with the law requiring that children should be vaccinated within a limited time after their birth.

When vaccination is spoken of as "compulsory," it is only meant that, in case a child is not vaccinated as prescribed by law, a pecuniary penalty is imposed which may be followed by distress and imprisonment. The liability to this penalty no doubt in many cases leads to vaccination, where it would otherwise be neglected; but, whether the penalty be enforced once or repeatedly it does not compel vaccination in all cases. If a parent is content to pay the penalty his child remains unvaccinated; there have been not a few cases in which repeated penalties have been thus paid. Vaccination could be made really compulsory only by taking the child from the parent and vaccinating it against his will, if he would not himself procure or consent to its vaccination. It is necessary to bear this distinctly in mind in considering the modifications of the present law which have been proposed. There may be some who would consider it both justifiable and expedient for the State thus to take the matter into its own hands, and effectually ensure the vaccination of the entire population. We do not stop to inquire whether it would be justified in adopting such a method, for we are satisfied that no such measure, if proposed, would have any chance of acceptance; indeed, few even of the most ardent advocates of vaccination have hitherto made such a proposal. Nor, again, do we think that a proposal to substitute for the pecuniary penalty now imposed a more stringent form of punishment, such as imprisonment, would have any greater chance of acceptance.

511. If, then, the only kind of compulsion available is to attach some pecuniary penalty to the neglect of vaccination, the question to be determined is what form of law, based on penal provisions of this description, will secure the largest number of vaccinated persons. That this is the question to be solved has, we think, sometimes been lost sight of. In our Fifth Report we recommended that repeated penalties should no longer be enforced. Our proposal has been subjected to criticism on the ground that it would enable a person to break the law, and to purchase immunity by the payment of a single penalty. But there is no difference in principle whether immunity can be purchased by the payment of one or of several penalties. If the cases in which vaccination was omitted would be less in number, supposing one penalty only were enforced instead of many, the end which the Legislature sought to accomplish in enacting the compulsory vaccination law would be better attained. To secure that vaccination should be as widespread as possible is, we think, the object to be kept primarily in view. When an answer has been found to the question, what scheme which is within practicable limits would best conduce to that end, the form which legislation should take will, in our opinion, have been ascertained.

512. We have alluded to the mode in which pressure is at present exerted to secure vaccination; we must now direct attention to the machinery by which the law is enforced.

It is for the local authorities to put the law in motion. In England and Wales the guardians have been in the main an elected body, necessarily reflecting the views of those by whose votes they obtain their office. In some districts guardians have been elected from time to time solely because they have pledged themselves not to prosecute those who fail to have their children vaccinated. The enactments under which the guardians are the authority to enforce the vaccination laws contain no provision dealing with the case in which they neglect or refuse to do so. By a statutory Order made by the Local Government Board the duty of enforcing these laws has been cast upon the Guardians, and in the case of the Guardians of the Keighley Union a *mandamus* was issued by the Court of Queen's Bench commanding them to perform this duty. In default of obedience they were committed to prison. After a short incarceration they were let out on bail. When subsequently brought before the Court to answer for their contempt, they were released on entering into their own recognizances to come up for judgment when called upon. By the terms of the recognizance they were bound while guardians to do nothing in disobedience to the Vaccination Acts or to cause their operation to be in any way disturbed. The proceeding proved, however, quite ineffectual so far as vaccination was concerned. The same course was pursued afterwards as before. There is no process open for constraining guardians to enforce the vaccination law except a *mandamus* resulting in their committal to prison in case they refuse to obey the command of the court. Experience



has shown that when the guardians represent a local community opposed to vaccination this method of putting pressure upon them is inoperative to promote it.

513. We were anxious to learn to what extent the guardians in England and Wales had ceased to put the law requiring the vaccination of children in force. We accordingly made inquiry of the guardians throughout the country. Answers were received from 620 out of the 648 Unions. We found that the law was not being enforced in 122 out of these 620 districts; in 46 of the 122, however, the guardians based their action upon the fact that a Royal Commission had been appointed to inquire into the subject of vaccination and had not yet reported.

514. The question then naturally arises whether the institution of proceedings against those who do not procure the vaccination of their children as required by law should be transferred from the Guardians to some other authority, either universally or where the guardians refuse to prosecute. If such a change were made, the only alternatives would seem to be either to transfer the duty to some local authority having jurisdiction over a wider area, such as the County Council, or to vest it in the Local Government Board. We do not think it would be feasible to impose on the county councils the duty of enforcing the vaccination laws in cases where the local authorities neglected to do so. Such an arrangement would have the effect of bringing these councils at once into acute conflict with other local authorities exercising jurisdiction in different districts within the ambit of the several counties, and the practical difficulties involved in the scheme would obviously be great. If, then, any transfer to the county councils of the duty now incumbent on the guardians or other local bodies were deemed expedient, we think it would be found requisite to transfer the duty altogether. It is not certain that a change of the nature we are considering would lead on the whole to a more complete enforcement of the law relating to vaccination. In some cases it might do so; but, on the other hand, it might happen that the majority of a county council would be elected to support an anti-vaccination policy, in which case the area within which the vaccination laws were not enforced, might be extended. It is to be anticipated, too, that any proposal to cast the duty of enforcing vaccination upon county councils would encounter serious opposition.

515. The other alternative would be to vest the duty of prosecuting in the Local Government Board. It may be that it is already empowered to cause prosecutions to be instituted against defaulters. Article 17 of the Local Government Board Order of October 1874 provides that the vaccination officer of any district shall take any such proceedings as may be necessary under the Vaccination Acts in any case in which the Local Government Board may direct him to do so. But if this Article confers the power to direct a vaccination officer to prosecute, notwithstanding that the guardians, whose officer he is, have resolved not to enforce vaccination penalties, no such power has ever been exercised in spite of the fact that for years past the guardians in many districts have allowed the compulsory vaccination laws to fall into abeyance. Under these circumstances it is, to say the least, very doubtful whether the Local Government Board would without direct parliamentary sanction, even if they have the power to do so, adopt the new departure of overriding the action of the local authorities, to say nothing of the practical difficulties which such a course would present. It would not, in our opinion, be practicable altogether to withdraw the duty of proceeding against defaulters from local authorities and to vest it in the Local Government Board. If that Board is to discharge the duty at all, its intervention would have to be confined to cases in which the local authority failed to enforce the law. Even if the duty of the Local Government Board were thus limited the proposal might not improbably have to encounter the resistance not only of those who were opposed to compulsory vaccination, but of some who, though having no leaning in that direction, were keenly sensitive to any interference by a Government department with local authorities. The situation is by no means the same as if from the outset the law had been enforced by the Local Government Board. Moreover, it does not seem certain that, if the scheme we have been discussing were embodied in an Act of Parliament, it would achieve the desired end. In some parts of the country the action of the central body would most certainly be obstinately and even violently resisted, and that resistance would probably obtain the aid and sympathy of many who regarded the question of vaccination with indifference. The result might well be not more but less vaccination than at present.

516. Before proceeding to state the conclusions which we draw from the considerations to which we have been adverting, it is desirable to point out that it is only within a limited area in England and Wales that vaccination has fallen into more or less



disuse. The vaccination of the great majority of children is secured, where the practice is not voluntarily adopted, by the penalty to which the law subjects those who neglect to have their children vaccinated. It is not found necessary, in a large number of cases, to put the law in motion or to enforce the penalty; the mere liability to it is in general sufficient. It is worth giving the figures from a return presented to the House of Commons in 1890. It shows that, since July 1879 to the date up to which the return was made, the number of persons fined in England and Wales for breach of the vaccination laws was 11,408. Of these 115 were imprisoned. The date up to which the return extends is not stated, but it covers a period of at least ten years; so that the average number of fines per annum was about 1,100.

517. The necessity of proceeding to enforce a penalty, or at all events repeated penalties, arises for the most part in cases where the parent objects to have his child vaccinated, and not in cases of mere neglect or indifference. It is important to consider how it has come about that whereas in many parts of the country there is no serious objection to vaccination, in other places the objection is so acute and widespread that the opponents of the practice are enabled to elect guardians pledged to abstain from enforcing it. We believe that it has largely arisen from the attempt to compel parents to vaccinate their children who conscientiously believe that vaccination is of little or no advantage as a protection against small-pox, and that it involves a serious risk of injury to the health of the vaccinated child. Symptoms of injury following vaccination, and really or apparently connected with it, have occurred in the case, it may be, of an elder child of the same parent, or in the case of a neighbour's child; this immediately arouses hostility to vaccination, and induces the parent to resolve that his child shall remain unvaccinated. If the attempt be made to compel a parent, in this attitude of mind, to have his child vaccinated, it meets with determined opposition, and, where the penalty is repeated, the hostility is often intensified without any progress being made towards the vaccination of the child. Such a parent has often become a focus of hostility to the vaccination laws; his neighbours and friends take his side; he is regarded as a martyr; and he and they frequently become active agitators against the vaccination laws. There are, indeed, a central association and local associations which advocate the abolition of compulsory vaccination, and denounce the practice altogether; but it is local circumstances, such as we have described, which stimulate the creation of these local associations and give them their vitality, and which add to the force of the central association. It is often said that the opposition to vaccination is the work of agitators. This may be true; but the agitation, though it may be afterwards intensified from without, in our belief has its origin, almost invariably, in a particular locality. It is this, we, think, which accounts for the phenomena to which we have called attention that the acute opposition to vaccination is confined to a limited number of localities, and that it seems usually to spread from a local centre.

518. In Scotland the vaccination laws have encountered little opposition, the great majority of the children born are vaccinated. The enforcement of the law is there in the hands of the parochial boards. Some of these boards would seem to have exercised a discretion in subjecting defaulters to prosecution, though the exercise of this discretion does not appear to have been in strict accordance with the law. They have been in the habit of omitting from the list sent to the vaccination officer those whose names appeared on the registrar's list, but who had been already prosecuted, so that no further proceedings were taken against them. The practice of the parochial boards in this respect has not been uniform. We have no means of judging to what extent this discretion has been exercised, but we gather that it has been so to a considerable extent. The Scotch vaccination law and its methods of procedure, no doubt, tend to discriminate in a manner unknown in this country between the cases in which the failure to procure vaccination was due to hostility to the practice on the part of the parent, and those which resulted from mere neglect or indifference. In England and Wales, where a parent does not procure the vaccination of a child by a private medical practitioner or take it to a vaccination station for the performance of the operation by a public vaccinator, this may equally arise from objection to vaccination or from neglect or indifference. There is nothing tending to show what influence has led to the failure to procure vaccination. In Scotland the case is different. If a child is not vaccinated within the time specified in the notice received from the parochial board, the official vaccinator attends at the abode of the parent prepared then and there to vaccinate the child, unless consent to do so is refused. Its vaccination is therefore at once secured, unless the parent interposes a refusal, or the official vaccinator sees grounds, either on account



of the condition of the child or of local circumstances, to postpone the operation. The reason given by the parent for a refusal to permit vaccination is embodied in a certificate, and is thus in all cases recorded.

The statements we have made refer to the condition of things existing until 1894, when the Local Government Act was passed. The duties and powers of the parochial boards were by that Act transferred to the district councils, and the duties and powers of the Board of Supervision to the Local Government Board.

519. The details relating to defaulters in one half year which were furnished us by Mr. Skelton are worth giving with some particularity. The half year in question is that ending the 31st of December 1892. The number of persons returned as defaulters is 6,613. Of these there were returned as defaulters for the first time 4,327, so that the balance of upwards of 2,000 was brought forward from previous years. The number of children who had been vaccinated by the official vaccinator since the date of the list (prior to April 1893, when Mr. Skelton's evidence was given) was 1,006. The number of children since the date of the list vaccinated by other medical practitioners was 1,604. The number not vaccinated because they had died or left the parish or could not be found was 1,833, and because of postponement certificates, 1,178. The balance of 992 was made up as follows:—(a) children vaccinated but the certificates not transmitted, 207; (b) previous successful vaccination, 44; (c) insusceptible, 18; (d) undisposed of, cases being attended to (these had not been completed, the vaccinator, not being in a position to state whether vaccination had been successful or not), 125; (e) isolated position of houses in severe weather making it difficult for the vaccinator to carry it out, 161; (f) illness or omission on the part of the inspector of the poor, 66; (g) postponed on account of epidemics in the locality, 46; (h) delay pending the report of the Royal Commission on Vaccination, 10; (i) refusal of parents, 50; (k) delay of parents, 35; (l) on account of ill-health, 39; (m) unaccounted for entirely, no reason given, 194.

520. The number of prosecutions during the half year was 22 only. Of these 7 were for failure to transmit the certificate within the specified period, and 15 for refusal to allow the child to be vaccinated. Of those 15 there were 10 who were prosecuted for the first time, 4 who were prosecuted for the second time, and 1 who was prosecuted for the fifth time. These figures are instructive. In view of those quoted in the preceding paragraph, the number of prosecutions appears remarkably small, and it does not seem possible to doubt that the practice of the different parochial boards must have varied greatly.

The figures above given relate to the same half-year as that to which the figures in the preceding paragraph relate, and would have reference to some cases which had occurred in the previous half-year. The figures for the subsequent half-year, when some of the cases of default referred to in that paragraph would be dealt with, are as follows:—The number of prosecutions during the half-year was 11 only; of these 4 were for failure to transmit the certificate, and 7 for refusal to allow the child to be vaccinated.

521. We are now in a position to state the reasons which led us to recommend that repeated penalties should no longer be enforced; indeed they will be apparent from what we have already said.

We do not doubt that the fact that penalties may be repeated secures in some cases the vaccination of children who would otherwise remain unvaccinated; but we believe that the irritation which these repeated prosecutions create, when applied in the case of those who honestly object to have their children vaccinated, and the agitation and active propaganda of anti-vaccination views which they foster in such cases, tend so greatly to a disuse of the practice, in the district where such occurrences take place, that in the result the number of children vaccinated is less than it would have been had the power of repeated prosecution never existed or been exercised. This seems to us to be the crucial question. A law severe in its terms, and enforced with great stringency, may be less effectual for its purpose than one of less severity and which is put in force less uncompromisingly. When this is the case it cannot be doubted that the law which appears less severe is really the more effective. The ultimate object of the law must be kept in view. The penalty was not designed to punish a parent who may be considered misguided in his views and unwise in his action, but to secure the vaccination of the people. If a law less severe, or administered with less stringency, would better secure this end, that seems to us conclusive in its favour.



522. If, then, we cannot look with any certainty to a change of the authority whose duty it is to enforce the law as a means of securing vaccination in those districts where it has already fallen into disuse, it obviously follows that every endeavour should be made so to frame and to administer the law that opposition to vaccination should not spread to other districts, and that it should cease or diminish in those parts of the country where it at present prevails.

It is to be hoped that our Report will stimulate belief in the efficacy of vaccination, that it will remove some misapprehensions and reassure some who take an exaggerated view of the risks connected with the operation, as well as lead to a more ready enforcement of the law by local authorities.

523. Why, it is asked, should not vaccination cease to be compulsory altogether, and be left to the free choice of parents? If no penalty were attached to the failure to vaccinate, it is, we think, certain that a large number of children would remain unvaccinated from mere neglect on the part of their parents, or indisposition to incur the trouble involved, and not because they thought it better in the interest of their children. This appears to us to be a complete answer to the question. If we be right in the conclusions which we have expressed on the subject of vaccination, it is better for the child, and better for the community, that it should be vaccinated than that it should remain unvaccinated. A parent can have no inherent right under the circumstances to which we have alluded to prevent or neglect its vaccination. The difficulty arises where the parent abstains from procuring the vaccination of the child because he believes it will be detrimental to its interests. We do not intend to discuss the abstract question whether the State is entitled in such circumstances to compel the parent, in spite of this conviction, to see that his child is vaccinated; we will assume for the purpose of our argument that it is so entitled. This leaves untouched the question whether, on the whole, such a course conduces to a better vaccinated condition of the people. We think that ardent advocates of vaccination have not always borne in mind the practical consequences of an attempt to enforce the law in such cases. They have maintained that no one has a right to set up his judgment against that of the community embodied in the statute law, and to refuse in consequence to render that law his obedience; they have, therefore, opposed any relaxation of the laws relating to vaccination, assuming that because in particular instances it might lead to children remaining unvaccinated who would otherwise be vaccinated, it must necessarily result in a diminished number of vaccinations. We believe that this assumption is not well founded. It has been apparently forgotten that under the existing law a penalty, or even repeated penalties, can be paid without difficulty by a man only moderately well-to-do, and that a poorer man will constantly pay, or suffer a distress of his goods, or go to prison, rather than allow his child to be vaccinated. We think these ardent advocates have not always been the wisest friends of vaccination, and that there would have been more vaccinated persons if the law had been enforced with more discretion.

524. After careful consideration and much study of the subject, we have arrived at the conclusion that it would conduce to increased vaccination if a scheme could be devised which would preclude the attempt (so often a vain one) to compel those who are honestly opposed to the practice to submit their children to vaccination, and, at the same time, leave the law to operate, as at present, to prevent children remaining unvaccinated owing to the neglect or indifference of the parent. When we speak of an honest opposition to the practice, we intend to confine our remarks to cases in which the objection is to the operation itself, and to exclude cases in which the objection arises merely from an indisposition to incur the trouble involved. We do not think such a scheme impossible.

525. It must of course be a necessary condition of a scheme of this description that it should be such as would prevent an objection to the practice being alleged merely as an excuse to save the trouble connected with the vaccination of the child. We may give the following as examples of the methods which might be adopted. It might be provided that if a parent attended before the local authority and satisfied them that he entertained such an objection, no proceedings should be taken against him. Or, again, a statutory declaration to that effect before any one now authorised to take such declaration, or some other specified official or officials, might be made a bar to proceedings. We do not think it would be any real gain to parents who had no conviction that the vaccination of their children was calculated to do mischief, to take either of these steps rather than submit them to the operation.



526. It is in England that the point we have been recently discussing is of most practical importance, but if our suggestion were adopted the change should, of course, be made in all parts of the United Kingdom.

527. We are quite conscious that the proposal we have made will be regarded by some as a retrograde step in the cause of vaccination. We do not believe that it would prove to be so in practice. Too blind a confidence is sometimes reposed in the power of an Act of Parliament. It is thought that if the law be only sufficiently stringent and inflexibly enforced the desired end is sure to be attained. There is, however, abundant experience to the contrary. When that which the law enjoins runs counter to the convictions or prejudices of many members of the community it is not easy to secure obedience to it. And when it imposes a duty on parents the performance of which they, honestly, however erroneously, regard as seriously prejudicial to their children, the very attempt to compel obedience may defeat the object of the legislation.

At the same time we think it would be well to make the change a temporary one in the first instance, say, for a period of five years, and that in the meantime its effects should be carefully watched.

528. Whatever diversity of opinion there may be on the point just discussed, there can be no doubt that every effort should be made to remove the causes which now render vaccination burdensome and tend to its discouragement, and that such changes in our vaccination system should be made as would be calculated to promote vaccination and diminish the number of cases in which the practice is neglected.

529. We have no hesitation in expressing the opinion that the Scotch system is in some respects, to which we have called attention, superior to that prevailing in the other parts of the United Kingdom. Its great merit lies in this, that the defaulters are sought out at their own homes by the official vaccinator and then and there vaccinated by him, unless the parent objects or circumstances render postponement desirable. There is obviously a great difference between this system and one in which the vaccinator does not present himself at the child's home, but the child must be taken by the parent to a vaccination station and when the next step after default is a prosecution. We cannot doubt that the former is far better calculated than the latter to secure the vaccination of the people. On the other hand it appears to us a defect in the Scotch plan that gratuitous vaccination can only be procured for those who are not pauper children by making default, in other words, by failing to obey the law. For this reason we think it would not be wise to adopt that plan in England and Wales without modification. We think that where a certificate of successful vaccination is not received within the prescribed time a notice should be served upon the parent that a public vaccinator will attend on a day named for the purpose of vaccinating the child, unless the operation has been already performed, and that the only offence rendering the parent liable to prosecution should be the refusal to permit the child to be vaccinated by the public vaccinator when he attends for that purpose. The adoption of such a scheme would render the burden much less than it is where the child has to be taken to a public station, not only for the purpose of vaccination, but again at the end of a week for inspection. The vaccination and inspection would both take place at home. It is not only by rendering vaccination less burdensome that this would be an improvement, it would also, as we have already pointed out, tend to diminish risks of injury which arise when a child is conveyed twice to a public station, and which would be absent if the vaccination and inspection always took place at home. Moreover, the vaccination would be more certain to be postponed when the condition of the child or local or family circumstances make this course desirable. This again would diminish the risk attending vaccination. Further, the proposed change would render it easier to introduce the requirement, already alluded to, that the progress of the vaccination should be more carefully watched than it is at present, and any mistakes made in the treatment of the vaccination vesicles would be likely to be more early discovered and more readily remedied.

530. We think it would tend to promote vaccination if every duly qualified medical man who vaccinated a child successfully were entitled to the fee which is now paid only to the public vaccinator. We are aware that there is evidence tending to show that in England and Wales vaccination has been, speaking generally, more efficiently performed by public vaccinators than by other medical men. But the experience of Scotland, where only a minority of the vaccinated are dealt with by official vaccinators, shows that such a system may be a satisfactory one. Safeguards might be provided against inefficient vaccination. The fee should only be allowed in cases where the



certificate showed that the child had been vaccinated in accordance with the rules prescribed by the Local Government Board. And if every duly qualified practitioner who vaccinated a child successfully could claim the appointed fee, it could properly and ought, we think, to be made a condition that all children so vaccinated should be liable to inspection, and that the fee should not be allowed when the examination did not appear to have been performed in accordance with the prescribed rules. It would not, of course, be necessary to make such an inspection in every case; a limited number of test cases would suffice. The liability to inspection would prevent abuse, and under proper regulations we think the system might be an improvement on any at present existing.

531. We have already said that in our opinion the State is bound to see that a supply of calf lymph is within the reach of every vaccinator. Though this recommendation has been dictated by other reasons, its importance in connexion with the alteration in our vaccination system which we are now considering is apparent. It would at all events go far to secure that any defect in vaccination should not result from imperfection in the lymph employed.

532. The change which we propose in our vaccination system would no doubt render it somewhat more costly,\* but the difference would not be very great, and, in our

*\*Note.—In connexion with this, it may be well to indicate the approximate annual cost at the present time in England and Wales of the practice of vaccination, so far as that cost is borne by the public funds.*

*Out of the sums received from Poor Rates and in aid of Poor Rates, the expenditure for vaccination fees and expenses during the last ten years for which the figures are available was as follows :—*

| <i>Year ending<br/>Lady day :</i> | <i>Expenditure :</i> | <i>Year ending<br/>Lady-day :</i> | <i>Expenditure :</i> |
|-----------------------------------|----------------------|-----------------------------------|----------------------|
|                                   | £                    |                                   | £                    |
| 1886                              | 93,475               | 1891                              | 84,295               |
| 1887                              | 92,116               | 1892                              | 83,146               |
| 1888                              | 90,487               | 1893                              | 83,709               |
| 1889                              | 91,254               | 1894                              | 87,981               |
| 1890                              | 85,606               | 1895                              | 82,961               |

*Out of sums voted by Parliament or, more recently, out of county funds and charged to the Exchequer Contribution Account, there has been the following expenditure in respect of awards to Public Vaccinators :—*

| <i>Year :</i> | <i>Amount of awards to<br/>Public Vaccinators in Unions<br/>inspected during the years<br/>specified in the last column :</i> | <i>Year :</i> | <i>Amount of awards to<br/>Public Vaccinators in Unions<br/>inspected during the years<br/>specified in the last column :</i> |
|---------------|-------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------|
|               | £                                                                                                                             |               | £                                                                                                                             |
| 1885          | 17,687                                                                                                                        | 1890          | 15,638                                                                                                                        |
| 1886          | 18,964                                                                                                                        | 1891          | 13,625                                                                                                                        |
| 1887          | 17,313                                                                                                                        | 1892          | 15,289                                                                                                                        |
| 1888          | 17,974                                                                                                                        | 1893          | 14,286                                                                                                                        |
| 1889          | 15,042                                                                                                                        | 1894          | 12,171                                                                                                                        |

*The cost of the National Vaccine Establishment, which is a department of the Local Government Board, has been as follows :—*

| <i>Year :</i> | <i>Cost :</i> | <i>Year :</i> | <i>Cost :</i> |
|---------------|---------------|---------------|---------------|
|               | £             |               | £             |
| 1885-6        | 3,635         | 1890-1        | 3,263         |
| 1886-7        | 3,537         | 1891-2        | 3,193         |
| 1887-8        | 3,385         | 1892-3        | 3,081         |
| 1888-9        | 3,453         | 1893-4        | 3,019         |
| 1889-90       | 3,188         | 1894-5        | 3,205         |

*And there has also been, of course, the cost of the administration of the Vaccination Acts by the Local Government Board, the amount of which cannot be accurately stated.*



judgment, no consideration of cost ought to be allowed to stand in the way of any improvement which would render the operation less burdensome or diminish its risk. It is only fair to demand this if vaccination is to remain compulsory. In this connexion we may observe that the public vaccinator ought, in our opinion, to be under an obligation to afford medical attendance without cost to the parent in all cases in which the vaccination does not run an ordinary course, and owing to supervening illness such attendance becomes necessary. Whether the fee paid in respect of vaccination should be fixed at such an amount as to cover this extra attendance in the exceptional cases in which it would be requisite, or whether it should be the subject of special compensation, is a matter of detail on which the Local Government Board is in a better position to form an opinion than we can be. Inasmuch as compulsory vaccination is justified on the ground that it is not a matter which concerns alone either the parent or the vaccinated child, we think a provision such as we have indicated would be both just and reasonable.

533. We have already adverted to the importance which we attach to re-vaccination. It has been suggested that the operation should be made compulsory by law. We are quite alive to the protective value of general re-vaccination. At the same time we are not insensible of the difficulties necessarily involved in rendering it compulsory. It is, comparatively speaking, easy in the case of infants to ascertain whether the law requiring vaccination has been complied with. The constant movement of the population would render it much more difficult to ascertain whether at the more advanced age at which it would become applicable, a law providing for compulsory re-vaccination had been observed. Again, it is impossible to leave out of sight the effect that such an extension of the present compulsory law might have in intensifying hostility, where it at present exists, and even in extending its area; though if our recommendations, especially that which exempts from penalty those who honestly object to the practice, were adopted this objection would be much diminished. After full consideration of the question we are, however, deterred by the considerations to which we have adverted from proposing that re-vaccination should be made compulsory. At the same time in view of the great importance of re-vaccination we think it should be in every way encouraged. If an adequate fee were allowed in every case of successful re-vaccination, by whatever medical man it was performed, we think there would probably be a large extension of the practice. We think steps should be taken to impress on parents the importance of having their children re-vaccinated not later than at the age of twelve years. We recommend further that when small-pox shows signs of becoming epidemic special facilities should be afforded both for vaccination and re-vaccination.

534. We think that notification of small-pox should everywhere be compulsory, and, whenever the disease showed a tendency to become epidemic, a notice should be served by the sanitary authority upon all persons in the neighbourhood who would be likely to come within the reach of contagion, urging them to submit to vaccination or re-vaccination, as the case might be, if they had not been recently successfully vaccinated or re-vaccinated; and attention should be called to the facilities afforded for their doing so. Attention should also be called to the importance of avoiding contact with persons suffering from the disease, or coming into proximity to them, and of avoiding contact with any person or thing which may have become infected. It is important to notice that, even where vaccination has been neglected, there is great readiness to submit to it in the presence of a threatened epidemic; a large number of vaccinations are then obtained willingly and without opposition. Whenever a sanitary authority has received notification of a case of small-pox, we think the fact should be at once communicated to the vaccination authority of the district in which the case of the disease has occurred.

535. We desire to call attention again to the recommendation, which we made in our fifth interim report, that persons committed to prison by reason of the non-payment of penalties imposed under the vaccination laws, should no longer be treated as criminals. We stated in that report our reasons for this recommendation, to which we still adhere. If, however, the changes in the compulsory provisions of the vaccination laws which we have suggested were adopted, the matter would lose much of its importance.



536. We have had the misfortune to lose by death several of our colleagues. Mr. Bradlaugh died at an early stage in the inquiry, and was replaced as a member of the Commission by Mr. Bright. Sir William Savory and Dr. Bristowe died at a later period, and their places have not been filled. We are deeply sensible of the valuable assistance in the preparation of this Report of which death has thus deprived us.

537. We cannot conclude our labours without expressing our sense of the great assistance we have derived from the zeal and ability with which our Secretary, Mr. Ince, has discharged his duties.

All which we humbly submit for Your Majesty's gracious consideration.

(Signed)   HERSCHELL.  
                   JAMES PAGET.  
                   CHARLES DALRYMPLE.  
                   W. GUYER HUNTER.  
                   EDWIN H. GALSWORTHY.  
                   JOHN S. DUGDALE.  
                   M. FOSTER.  
                   JONATHAN HUTCHINSON.  
                   FREDERICK MEADOWS WHITE.  
                   SAM. WHITBREAD.  
                   JOHN A. BRIGHT.

BRET INCE,  
 Secretary.

August 1896.

The undersigned do not find themselves able to go so far in recommending relaxation of the law as is implied in paragraphs 524, 525, 526, and 527. We think that in all cases in which a parent or guardian refuses to allow vaccination, the person so refusing should be summoned before a magistrate, as at present, and that the only change made should be to permit the magistrate to accept a sworn deposition of conscientious objection, and to abstain from the infliction of a fine.

We are also of opinion that, in spite of the difficulties as set forth in paragraph 533, a second vaccination at the age of twelve ought to be made compulsory.

W. GUYER HUNTER.  
 JONATHAN HUTCHINSON.

We the undersigned desire to express our dissent from the proposal to retain in any form compulsory vaccination. (Paragraphs 509, 511, 522, 523, 524, 525, 529.)

We cordially concur in the recommendation that conscientious objection to vaccination should be respected. The objection that mere negligence or unwillingness on the part of parents to take trouble might keep many children from being vaccinated would be largely, if not wholly, removed by the adoption of the Scotch system of offering vaccination at the home of the child, and by providing for medical treatment of any untoward results which may arise.



We therefore think that the modified form of compulsion recommended by our colleagues is unnecessary and that in practice it could not be carried out.

The hostility which compulsion has evoked in the past toward the practice of vaccination is fully acknowledged in the Report. In our opinion the retention of compulsion in any form will in the future cause irritation and hostility of the same kind.

The right of the parent on grounds of conscience to refuse vaccination for his child being conceded, and the offer of vaccination under improved conditions being made at the home of the child, it would in our opinion be best to leave the parent free to accept or reject this offer.

SAM. WHITBREAD.

JOHN A. BRIGHT.

W. J. COLLINS.\*

J. ALLANSON PICTON.\*

\* *Note.*—Dr. Collins and Mr. Picton sign the above note of reservation, though they have not signed the Report. A statement of their grounds of dissent from the Report will be found on page 156 and following pages.

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## APPENDIX I.

*Detailed discussion by the Commission of:—(A.) The “Variolous Test”; and  
(B.) Woodville’s cases.*

(A.)—The “Variolous Test.” (See §§ 13–17 of Report.)

In the practice of inoculation for the small-pox it was observed in successful and normal cases that on the 2nd and 3rd day, the part of the skin into which the small-pox matter had been inserted became red and hard, that is to say, inflamed. On the 4th day the beginning of a vesicle might be detected. On the following days the vesicle became more distinct, and surrounded by an area of redness, the so-called efflorescence.

On the 6th day some pain in the axilla was usually felt, and on the 7th or the 8th day, general disturbances constituting the “eruptive fever” or “fever of invasion” made their appearance. This lasted some two or three days, subsiding soon after the appearance, towards the end of the 10th or on the 11th day of pustules on the surface of the body other than the seat of inoculation. This eruption of pustules usually lasted about three days. When these pustules began to suppurate, as they usually did on the 13th or 14th day, a secondary fever, whose intensity was greater or less according as the pustules were many or few, was observed.

The eruptive fever was regarded as an indication, the axillary pain being a premonitory symptom, that the virus had “affected the system.” The changes taking place previous to the eruptive fever were held to be purely local; the matter inserted produced in the inoculated spot a series of events, but these were limited to seat of inoculation, and did not spread beyond. So soon as the local changes caused by the virus began to produce effects in the body at large, those effects were revealed, first, by the eruptive fever, and later on by the eruption of pustules. And it was held that immunity towards small-pox was only secured when the “system,” the body at large, had thus been “affected;” the mere local changes were not sufficient to produce immunity.

When the pustules made their appearance in parts of the body distant from the inoculated spot, even though they might be few, no doubt was entertained but that the system had been affected and immunity secured. But at times no eruptive pustules at all made their appearance, and the evidence of the system being affected was less conclusive.

So far as can be judged from the writings of Sutton and Dimsdale, these inoculators (in cases rendered doubtful by the absence of eruptive pustules) trusted to the eruptive fever as the sign that the system had been affected. And the same may be said of Gatti, for though he has been accused (Bromfield, *Thoughts*, &c., p. 44) of “giving the disorder” (*i.e.*, inoculating) “without the sensible effect of either fever or eruption,” his own writings do not bear this out; he says (*Nouvelles Réflexions*, 1767, p. 91), “the third period is marked by the fever,” and again (p. 94) that the fever “is the sole constant symptom of the action of the virus on the total of the animal economy”; and, again, in treating of the fever attendant on the suppuration of the eruptive pustules which he insists is not the special and immediate effect of the variolous virus, he points out that when the pustules are few the suppurative fever is slight, and that when there are no pustules it is absent, and “the malady is finished at the same instant that the eruptive fever has ceased.”

Of course the symptoms of the eruptive fever formed, even at the best, a far less definite sign of the system being affected than did the eruption of pustules; and it is highly probable that inoculators, in cases where eruptive pustules were absent, may have at times mistaken a feverish disorder of intercalated origin for the specific eruptive fever. On the other hand, anomalous cases occurred in which the signs of the “system



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"being affected" did not include a distinct fever, that is to say, a rise of the temperature of the body. Dimsdale (" *The Present Method of Inoculating*," 6th ed. 1772, p. 47, et seq.) dwells on and gives the details of several of such cases. He speaks of them as instances of "a short way of having the distemper," and insists on the variety and irregularity of the symptoms manifested by such cases. Briefly put, in such cases the local effects advance prematurely, the whole malady being, sometimes, over in a week; there is no eruption, or a slight and imperfect one, and the signs of "the system being affected" are limited to chilliness, slight pains, giddiness, and a slight headache, "sometimes attended with a feverish heat, but often without any." Elsewhere he speaks of a peculiar offensive smell of the breath as being specially diagnostic of the system being affected. When Dimsdale first met with these cases he doubted whether the disease had been really taken, but, in a manner which will presently be described, satisfied himself that it had. He goes on to say that his subsequent experience enabled him from the early appearances of the local effects "to foretell in two or three days after the operation when the disease will pass in this slight way."

Thus the inoculator was not satisfied that the disease had really been given unless the local effects were accompanied by an eruption of pustules, or, failing them, by an eruptive fever, or, at least, by certain symptoms which he accepted as signs that the system had been affected.

When an inoculator met with a case in which from an absence of eruptive pustules, or from the symptoms of the eruptive fever being ill defined, or from the presence of other anomalous features, it seemed to him, or, indeed, to the patient, doubtful whether the disease had really been given, it was not an uncommon practice to repeat the inoculation. If the second inoculation failed, the result was taken as evidence that the first inoculation had really given the disease, and so conferred immunity; a conclusion sometimes further tested by a third inoculation, or even several in succession. If the second inoculation succeeded, that is produced a local pustule, with eruptive fever and an eruption of pustules, (the latter, however, being possibly absent), or at least with symptoms indicating that the system had been affected, the result was taken to show that the first inoculation had not really produced the disease. In this way the "variola test" came into use as applied to small-pox inoculation, and was subsequently applied to cow-pox inoculation.

The experience of those inoculating persons who had previously had the small-pox, either by inoculation or in the natural way, disclosed that the local changes induced at the seat of inoculation might be various. Sometimes the wound healed immediately without any further effects at all. Sometimes inflammation set in, in some cases slight, in other cases considerable, and lasted for a variable time. Sometimes such an inflammation even when considerable was not specific, being merely what we should now call septic, and this, perhaps, was especially likely when the method of inoculation was by an incision, and not as in the improved method by a puncture. Sometimes the inflammation was specific, and a vesicle, passing on to a pustular condition, and then presenting the ordinary characters of a small-pox pustule, was formed. But in such cases, so long as there was no eruptive fever, or no special constitutional disturbances (it is needless to say so long as there was no eruption of pustules) it was concluded that, though the local changes might be regarded as specific, the existing immunity of the subject prevented the system being affected. All through the literature of inoculation a strong contrast is insisted on between the local changes, however specific, and the constitutional effects. On the one hand, local changes, of so distinctly a specific character that matter taken from the pustule produced "a perfect small-pox" when inoculated into other subjects, might go on in a subject suffering only from the local changes, and not having really the disease as shown by his afterwards "passing through the small-pox either in the natural way or by inoculation" (Harrison, *Med. Phys. Jl.*, Vol. V., p. 109). On the other hand, a subject rendered immune towards the disease by a previous attack, might have as the result of inoculation specific local changes giving rise to a pustule of specific small-pox nature, the immunity being shown by the absence of constitutional effects; in this relation is quoted the common experience that variolous pustules (due to accidental or intentional inoculation) might appear on small-pox nurses, who had previously had small-pox, pustules distinctly variolous, but entirely local and unaccompanied by any "affection of the system."

So far as can be judged from the literature of the subject, the ordinary experience of applying the variolous test to persons who had previously had small-pox, either by inoculation or in the natural way, was that the effects of the test inoculation were limited at most to a little inflammation, dying away in at longest a few days; the experience of a definite pustule being formed appears to have been rare. And



in all cases the inoculators seem to have had little hesitation in deciding whether immunity was secured or not, being guided in the instances in which the local changes were considerable, by the presence or absence of symptoms indicating that the system had become affected.

The following passage from Dimsdale illustrates how, amid the varying results presented by the "variola test," the inoculator saw his way to conclude whether the test showed immunity or no. The cases of "the short way of having the distemper" were subjected by Dimsdale, in his early experience, while he was as yet in doubt whether such cases had really had the malady or no, to the test on the one hand of severe exposure to contagion, and on the other hand of a second inoculation. He describes the results of the second inoculation thus—*op. cit.* pp. 50, 51:—

"Upon the second inoculation, however, the incised parts are commonly inflamed for a day or two, just in the same manner as I have, in numerous instances, found them to be as well in those who, though certain of having had the small-pox in the natural way, have submitted to be inoculated merely for the experiment sake, that the result might be observed, as in others, who, being doubtful whether they have had it or not, have been inoculated, in order to be satisfied. But in all such cases the parts soon became well; nor did any of those appearances which have been described as the constant attendants on inoculation, as pain in the head, giddiness, marks of infection on the arm, &c. ensue; nor can they ever be produced upon a person who has had the small-pox before, either in the natural way or by inoculation; and therefore it cannot with reason be suggested, that the patients, whom I suppose to get through the disease in the very slight manner above described, may possibly have had the small-pox unobserved in some former part of their lives."

That is to say, Dimsdale recognised a clear distinction between the maximum effects of inoculation applied to one who had had the small-pox before, the inoculation being then the variola test, and the minimum obvious effects of inoculation consistent with its really giving the disease in one who had not had it before.

And the inoculators of cow-pox appear to have used the variola test for immunity in the same way and under the same conceptions as did the old inoculators of small-pox.

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(B.)—*Woodville's cases.* (See §§ 18-23 of *Report*.)

As we have stated in the body of our Report (§ 21): "Of the cases recorded by Woodville in his Reports, the larger number, about three-fifths, presented an important and, as compared with Jenner's cases, a new feature, in that, in addition to the changes taking place at the seat of inoculation and constituting what Woodville called the 'cow-pox tumour,' which may here be spoken of as the 'vaccine vesicle,' an eruption over the body of a greater or less number of pustules was observed. These eruptive pustules occurred in the very first cases; of the seven cases inoculated from the cow, four, and of the five inoculated from the dairymaid, four had such pustules; and their appearance is recorded again and again in the series, down to the case which appears last but one in the tabular statement forming part of the Reports. Moreover an eruption of pustules is described in certain of the cases of which accounts were published at about the same time by Pearson and many others. In some of these cases the lymph used was supplied from the Small-pox Hospital by Woodville or Pearson."

Those eruptive pustules (we may put on one side the cases in which an eruption of mere papules or pimples is recorded), possessed characters very different from those of the pustule, vesicle, tumour, or whatever it be called, which was produced at the seat of inoculation with the cow-pox matter. The latter presented certain features which distinguished it from the small-pox pustule, whether of inoculation or eruption. These distinctive features had of course to be learnt by the early vaccinators since they were dealing with a new subject. Jenner in his first case described the local appearances of inoculation with cow-pox matter as being much the same as those resulting from inoculation with small-pox; but he soon learnt to distinguish between the two, as did also Woodville, Pearson, and the rest. Woodville had certainly arrived at this knowledge by the time he wrote his Reports, for he there describes in detail the



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differences between the two, and probably had reached it in his early, if not in his very first cases. So sharply did he, at a later date, recognise the differences that he is able to speak of a small-pox pustule making its appearance within the margin of a cow-pox tumour.

The eruptive pustules, on the other hand, though they sometimes presented variations especially as regards suppuration, were, as a rule, identical in external characters with those of small-pox. And it may at once be admitted that they were actually the pustules of small-pox—were indications that the individual on whom they appeared was suffering from small-pox.

It is true that in the practice of vaccination, cases have from time to time occurred in which a general eruption of vesicles has been observed under circumstances which seem to preclude all possible coincident small-pox; in such cases the eruption appears to be a manifestation of the vaccine virus itself, and the cases are spoken of as those of “generalised vaccinia.” The evidence available is not sufficient to show whether any of the eruptions recorded by Woodville and others were of this nature, and it may be taken for granted that at least the majority of cases were not, but were the eruptions of small-pox.

Woodville himself did not at first recognize that these eruptive pustules were those of small-pox; he for some time thought that, in spite of their likeness to those of small-pox and their unlikeness to the local cow-pox tumour, they were a natural part of the cow-pox disease; and under this idea he spoke of the cow-pox disease resulting from the inoculation of cow-pox matter, as being mild or severe according to the less or greater number of eruptive pustules, the mildest being those in which there were none at all; he used the terms commonly applied to the small-pox disease resulting from the inoculation of small-pox matter. Pearson also (*Med. Phys. Jl.*, vol. III., pp. 97 and 399) held similar views. But later on, Woodville certainly, and Pearson apparently as well as all the others arrived at the conclusion which Jenner had reached much earlier, that the pustules in question did not truly belong to cow-pox, but were really those of small-pox, and that the cases in which they occurred were cases of cow-pox and small-pox occurring together.

Woodville, during the period of his belief that the eruptive pustules were a natural part of the cow-pox, repeatedly made use for inoculation of matter taken from the eruptive pustules; even in the second series of cases recorded in his reports many instances of this occur. Such cases must be regarded as simply cases of inoculated small-pox, and they were apparently early recognized as such, for they were soon stopped; the cases by which the practice of vaccination was carried on and made its way were cases in which the matter used had been taken from the cow-pox tumour at the seat of inoculation.

It being granted that the cases in which eruptive pustules appeared were cases marked by the presence of small-pox, the question arises—How did the introduction of small-pox take place?

Before discussing this it will be useful to call to mind what is known concerning the behaviour of cow-pox and small-pox occurring at the same time on the same person. The evidence, which subsequent to the date of the events now being treated of has accumulated in support of the view that vaccination confers immunity towards small-pox, shows, at the same time and by similar lines of argument, that the establishment of immunity is not brought about until some days after the act of vaccination, after the introduction into the skin of the vaccine virus; and, further, that the effects of the nature of immunity towards small-pox, produced by vaccine, are dependent on the relations as to time of the introduction into the system of the two viruses. Thus it is admitted, that if vaccination be performed during the period of incubation of small-pox, that is to say, the period elapsing between the introduction by contagion into the system of the virus and the occurrence of the first symptoms, or at least after the third day of that incubation, the vaccine is powerless to confer immunity.

Similarly the evidence which showed that at a certain date after vaccination the attempt to produce small-pox by inoculation failed, also showed inoculation could bring about small-pox if done in the early days of vaccination, not later than the eighth or ninth day.

Hence, as has been repeatedly seen, under certain conditions small-pox and cow-pox may occur together at the same time in the same person.

Further, the evidence shows that the coincident presence in the body of the one disease does not affect the characters of the other, that, for instance, the coincident presence of small-pox does not modify the cow-pox, does not “variolate” the cow-pox, to use the word then employed. Thus, as Woodville himself points out (*Reports*,



Crookshank, p. 148), if "on the same day a person be inoculated in one arm with the matter of the cow-pox, and in the other with that of the small-pox, both tumours preserve their respective characteristic appearances throughout the whole course of the disease." Indeed he (*Observations*, p. 12) quotes the observation that if cow-pox and small-pox be inoculated at the same time into the same arm "with in an inch of each other so that on the ninth day the same efflorescence becomes common to both the local affections," matter from the cow-pox tumour produces the genuine vaccine disease:—"I am convinced the matter thus taken would not be more liable to produce pustules or a less favourable disease than matter procured directly from the cow."

Woodville, moreover, relates an experiment in which he inoculated a number of persons with matter consisting of equal parts of cow-pox and of small-pox matter well mixed together. "In more than half, the local affection distinctly assumed the characters of the cow-pox; in the others it more resembled the small-pox, but in none of them was there much indisposition or many pustules." It is doubtful whether any great stress ought to be laid on this experiment, but it may at least be taken to show that when the two kinds of matter are introduced into the same spot of the skin, they do not produce a hybrid local affection partaking of the characters of both, but give rise either to one or to the other. Whether the fact that in the greater number of cases the result was cow-pox shows that the cow-pox matter is prepotent, or "takes" more readily, need not be considered here; and the evidence just given precludes the view that the mild character of the small-pox was due to any action of the cow-pox. Nor has subsequent experience brought to light any evidence as to the possibility of any such hybrid disease; the presence in the body of the one virus modifies the effect of the other virus, but not the nature of the virus itself. It is true that, later on, in 1827, one Guillou (*Journal Général de Médecine*, XCVIII. p., 239), using lymph taken from a case of variola which had previously been vaccinated, and in which the disease appeared in the modified form known as "varioid," not only produced local vesicles resembling those of vaccine and unaccompanied by eruptive pustules, but also carried the lymph through two other removes with the same results, and therefore maintained that the virus of the variola had, through the influence of the previous vaccination, been so affected as to assume the characters of the virus of vaccine. But a second attempt was not so successful, and his conclusions did not find acceptance. And indeed, while the details given of his cases by Guillou are insufficient to determine whether the local vesicles had truly vaccine characters, the absence of eruptive pustules may be regarded as being simply accidental, such an absence being possible though unusual.

The introduction of small-pox into Woodville's cases may have taken place in one of three ways:—

- (i.) The cases either lived in the hospital or at least were brought to the hospital to be vaccinated, and so were much exposed to the contagion of small-pox. They might thus have caught small-pox at the hospital, or might indeed have caught it at their homes, and thus have suffered from natural or casual small-pox at the same time that they were undergoing cow-pox.
- (ii.) In several cases the patient was inoculated for small-pox very early after vaccination, and thus, as has been shown above, may have had the two diseases together.
- (iii.) The lancet used for introducing the cow-pox matter might have had adherent to it some small-pox matter left from previous use. Woodville states expressly in speaking of the first cases with pustules that the lancets supplied to him were said to be freshly ground; but experience has shown how easily in like cases error creeps in; even in these first cases, and probably still more in other later cases, where no special care is recorded as being taken, this means of the introduction of small-pox must be considered as *à priori* possible.

When we come to consider, in respect to individual cases, such facts as are recorded of their history, these do not seem adequate to form a sure judgment of the mode of introduction of the small-pox. In this relation a special interest attaches to the case of Collingridge, one of the seven cases vaccinated from the Gray's Inn Lane cow, and the one whose local tumour at the seat of inoculation supplied matter which was passed in succession through many persons and was the origin of much of the lymph used or distributed by Woodville. For if the small-pox from which Collingridge obviously suffered shortly after she was inoculated from the cow was due either to her being inoculated with small-pox on the fifth day after inoculation from the cow or to natural contagion, there is no reason whatever to doubt that the local effects produced by the



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inoculation from the cow was, as Woodville considered it, a cow-pox tumour; that is to say, a vaccine vesicle; that the matter—lymph—taken from this local tumour was veritable cow-pox matter, and that the series of cases through which it was propagated were cases of cow-pox. But, on the other hand, if Collingridge's small-pox were due to the lancet by means of which the cow-pox matter from the cow was inserted in her left arm, having, in spite of precautions, still attached to it some small-pox matter, which small-pox matter was effective, the cow-pox matter failing, then it may be maintained, and indeed, has been maintained, that the local effects on that arm, in spite of its presenting characters which led Woodville to call it a cow-pox tumour, was in reality a small-pox pustule, the matter taken from it was small-pox matter and not cow-pox matter, and the series of cases through which it was propagated were cases of small-pox, and not at all of cow-pox.

When the details of the history of Collingridge's case as recorded by Woodville are examined, it is found that they do not of themselves justify a clear decision as to how the small-pox was introduced; these details are as follows:—

Collingridge was inoculated on the left arm with cow-pox matter. On the fifth day she was inoculated with small-pox matter on the right arm. On the eleventh day (sixth day of variolous inoculation) she "complains of headache and pains about the "loins," signs of 'eruptive fever.' On the thirteenth day (eighth day of the variolous inoculation) "several pustules appear"; on the fifteenth day (tenth day of variolous inoculation) "more pustules are scattered" over the body; on the seventeenth day (twelfth day of variolous inoculation) "the number of pustules is from one to two "hundred." Now, in the ordinary practice of inoculation with small-pox, the 'eruptive fever' began on the seventh, or more usually the eighth day, while the pustules made their appearance at the end of the tenth or beginning of the eleventh day, and usually continued to appear for three days. Hence the 'eruptive fever' (on the sixth day) and the appearance of pustules (on the eighth) are very early if we suppose them due to the variolous inoculation on the right arm. On the other hand, both the 'eruptive fever' (on the eleventh day) and the appearance of the pustules (on the thirteenth) are very late if we consider them as due to small-pox introduced by the supposed cow-pox inoculation on the left arm. But too much stress must not be laid on these dates, since though the times given above are those quoted as the ordinary ones, it was admitted that the eruption, and the fever precursory of it, might appear at an earlier or at a later date. Dimsdale (*Haygarth; Inquiry*, page 23) states, "In the "improved method . . . . . the eruptive fever in every instance within my "experience commenced on some day from the 6th to the 14th, both inclusive." This is consonant with either of the views in question. It sometimes happened (Sutton: "*The Inoculator*," page 118) that a few pustules appeared prematurely, especially near the inoculated spot, before the general eruption. The record on the fifteenth (tenth) day runs: "There are small pustules round the edges of the variolous tumour; more pustules "appear scattered over the face, body, and limbs." If we are allowed to regard the first half of this sentence as a fuller description of the pustules spoken of in the preceding paragraph of the record as appearing on the thirteenth (eighth day), then these pustules would appear to be such premature pustules belonging to the inoculation round which they occurred, and the real eruption of pustules must be considered as those spoken of in the latter half of the paragraph. If this be so, the whole eruption clearly belongs to the inoculation on the right arm and occurs at its proper time.

Suspicion of the left arm inoculation being really one of small-pox and not, as Woodville thought, of cow-pox is raised by the margin of the tumour being described on the 11th day as "beset with minute confluent pustules" (at this epoch the distinction now generally made between pustule (with pus) and vesicle (with lymph) was not as yet made) a character common in small-pox, but at least rare in cow-pox. But against this may be urged that the same tumour is described on the eighth day in the words, "its form is perfectly circular," whereas the margin of a small-pox tumour on the eighth day should be irregular or jagged. Further, even on the 13th day the left arm (cow-pox) tumour is beginning to scab, though it ought to be, as the left arm (small-pox) tumour actually was, still in the vesicular stage, and still surrounded by an efflorescence, an area of redness, if we consider that day as marking the eruption of pustules due to the left arm inoculation; the scabbing is all the more premature if, as suggested, the pustules appearing on the 15th day are to be regarded as the real eruption. Lastly, it was the experience of inoculators of the small-pox, that when a second inoculation was made some days after a first one, the progress of the second was accelerated, so that it overtook the first, and thus the two reached the same phase together; nothing of this is seen in Collingridge's two inoculations, the development of



each is independent of that of the other as was recognised to be the case when a cow-pox and a small-pox inoculation were performed at the same time, or nearly the same, time on the same person.

The child Buckland inoculated at the same time as Collingridge and with the same matter clearly suffered from small-pox. Further, the history of the eruption of pustules on the 10th and 11th day, and the appearance on the 7th day of two pustules near the inoculated spot, "premature" pustules, strongly suggest that the small-pox was introduced by the inoculation. Indeed this view presented itself to Woodville himself, but he rejected it on learning that his lancets had been newly ground. It is indeed possible that Buckland took small-pox in the natural way, and the eruption taking place on the 10th day of inoculation was a mere coincidence; but the former view is the more probable; and if Buckland was thus given small-pox by mistake, the same mistake might very well be made in Collingridge's case.

Thus while some of the facts of Collingridge's case point to the first inoculation, others point to the second inoculation as having served for the introduction of small-pox; and, even if the latter be considered as on the whole outweighing the former, they at least do not afford a conclusive proof. The exact nature of the effect on Collingridge's left arm, called by Woodville a cow-pox tumour, must be determined by help of general considerations touching the history of the whole of Woodville's cases.

The view that Collingridge's case was in reality one simply of small-pox has been developed somewhat as follows:—The local effect produced by the virus used to inoculate Collingridge took on, for some reasons or other, characters like, but not absolutely identical with, those of cow-pox; the virus in other words "sported" so as to simulate cow-pox. Matter from this local pustule used to inoculate others, and then others again in succession, the matter being always taken from the local pustule, the inoculation being "arm-to-arm," preserved or rather increased its likeness to cow-pox, the local effect being after a while at least quite indistinguishable from that produced by true cow-pox. It was, found moreover, in many cases still further to simulate cow-pox in that eruptive pustules were absent. And by selecting mild cases, that is, cases in which the eruptive pustules were absent or scarce, this feature of the absence of pustules was fixed, so that eventually absence of pustules was the ordinary result, pustules appearing on rare occasions only. Thus by selection what started as small-pox became indistinguishable from cow-pox. We have further to suppose that the modifications in the nature of the virus put on by the sport was limited to the local tumour. Matter from the local tumour produced a like local tumour, with or without an eruption of pustules; matter from the pustules always or almost always gave rise to eruptive pustules; the local tumour in these latter cases is not accurately described in the record, but in one case, (140th,) is spoken of as "having an angulated border," that is, having small-pox characters.

Support to this view in the way of analogy is furnished by the experience of Adams who, starting with a variety of small-pox known at the time as the "pearly sort," succeeded in obtaining a local effect, which he describes as "having a vaccine appearance," which he was able by arm-to-arm inoculation to propagate, with preservation of its characters, through several generations, and which in some of the cases further simulated cow-pox in the absence of eruptive pustules. He also described a second series with similar results. So far as it goes, Adams' experience is to the point. But Adams' recorded cases are very few; and as Adams himself remarks of the cases, "They are not entitled to the degree of confidence as to the probability of retaining a permanent character which the cow-pox may claim, nor is there any proof that these vesicles are not infectious." (*On the Cow-pox*, page 158.) Both series suddenly came to an end.

Against the support afforded by Adams may be placed the fact that the wide experience of the inoculators of small-pox by the improved method during the latter part of the 18th century, affords no support to the view which we are discussing. The object of the improved method was, as has been said, to produce a mild form of small-pox, that is, one with as few pustules as possible, but one, nevertheless, conferring immunity; and had either Sutton or Gatti, or any other inoculator come across a strain of small-pox matter, which, while conferring immunity, could be propagated from arm-to-arm without eruptive pustules, they would, we may be sure, have made much of it. But the literature of the subject records nothing of the kind. Indeed there is no evidence even, that the practice of arm-to-arm inoculation tended to secure paucity or



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absence of eruptive pustules. The practice has indeed, by some writers, been said to be part of the "improved method"; but neither Sutton nor Gatti in the instructions which they give as to their mode of procedure, put this among them. That it was certainly not an essential part of Sutton's ordinary practice, may be inferred from an incidental remark of his (*The Inoculator*, page 60), that on one day he inoculated 700 persons *from the same subject*. Dimsdale, again (*On Inoculation*, 6th edition, page 26), says, "It seems to be of no consequence whether the infecting matter be taken from the natural or the inoculated small-pox: I have used both, and have never been able to discover the least difference, either in point of certainty of infection, the progress or the event; and, therefore, I take the infection from either as opportunity offers, or at the option of my patients or their friends." He adds, however, "In all cases when I take matter from an inoculated person, it is from the place where it was inserted; as I am always sure to find infection there if the disease succeeds and always of sufficient energy." Further, as an argument against arm-to-arm inoculation at all ensuring a paucity of pustules, Bromfield recounts (*Thoughts, etc.*; 1767; page 10) how, with matter which had been propagated by arm-to-arm inoculation through 14 generations, 20 children who had all undergone the same kind of preparation were inoculated at the same time; of these "some had the disease very mild and others rather severe."

Sutton, moreover, so far from expecting mild cases to produce mild cases, appears to have thought the opposite; for his work contains a remarkable passage (pages 58-9), in which, after stating that people in general and even the majority of inoculators limited themselves in the choice of matter for inoculation to the "good natural state of health of the subject from whom the matter is to be collected; preferring a mild, benign sort to a copious, malignant, ill-conditioned species," he says, "I have my objections to inoculate those whom upon examination I rank under the class of unfavourable subjects, from such as have a very benign small-pox, or from those whose arm indicates such benignity"; by the former meaning apparently matter taken from a case in which the eruptions had come out, and, therefore, probably from a natural case; by the latter, matter taken from the local pustule at a time when the eruption was not yet out, the character of the local pustule indicating that the eruption would probably be a mild one. He believes such an inoculation would give more of the disease than an inoculation "from a malignant sort, or from those whose arms indicated such malignity." He even says, "I usually employ matter from an untoward stock."

Moreover, the history of the use made of Collingridge's lymph as recorded in Woodville's Reports does not show any selection of non-eruptive cases leading to a gradual elimination of pustules; the appearance of the pustules was irregular and fitful. Woodville, it is true, remarks that while matter taken from a case without pustules may give rise to pustules in others, "yet it has much more commonly had the effect of exciting a milder disease than the matter of the (eruptive) pustules, or than that which was obtained from a patient who had the disease in a severe manner as may be seen by an examination of the table." But though the table shows this clearly as regards the cases in which matter was taken from the pustules, or from cases which had been inoculated from the pustules, it does not show clearly any elimination of pustules in the series originating in Collingridge.

This will be evident from the following table in which the matter from Collingridge is traced out. There is no obvious progressive elimination of pustules. Of the 122 cases, 54 (about 44 per cent.) are non-pustular; while the last four groups give 23 cases with 15 non-pustular (*i.e.*, about 65 per cent.), the four groups just earlier give 29 cases with 11 non-pustular (*i.e.*, about 38 per cent.), and the three groups just earlier give 30 cases with 14 non-pustular (*i.e.*, about 47 per cent.). One of the best groups (that is, most free from pustules) is that from Bumpus, the second remove; one of the worst is that from Spooner, the last remove but one recorded, though Spooner was a milder case (with fewer pustules) than Bumpus; and S. Timms, with no pustules, gives worse results than Platford, with a thousand—both equally removed from Collingridge. Matter from Bumpus, used outside the Hospital (namely, by Jenner and Marshall) gave only one or two pustular cases in more than 300 cases; but on this we shall dwell later on. It is singular that Woodville allowed Bumpus strain to drop, and it is worth while noting how many of the cases are derived from Jewel, who had no eruptive pustules; and whose case is insisted on by Woodville himself as a proof that the matter he was using was cow-pox since Jewel had previously had small-pox, and had the matter with which she was inoculated been small-pox it ought not have taken.

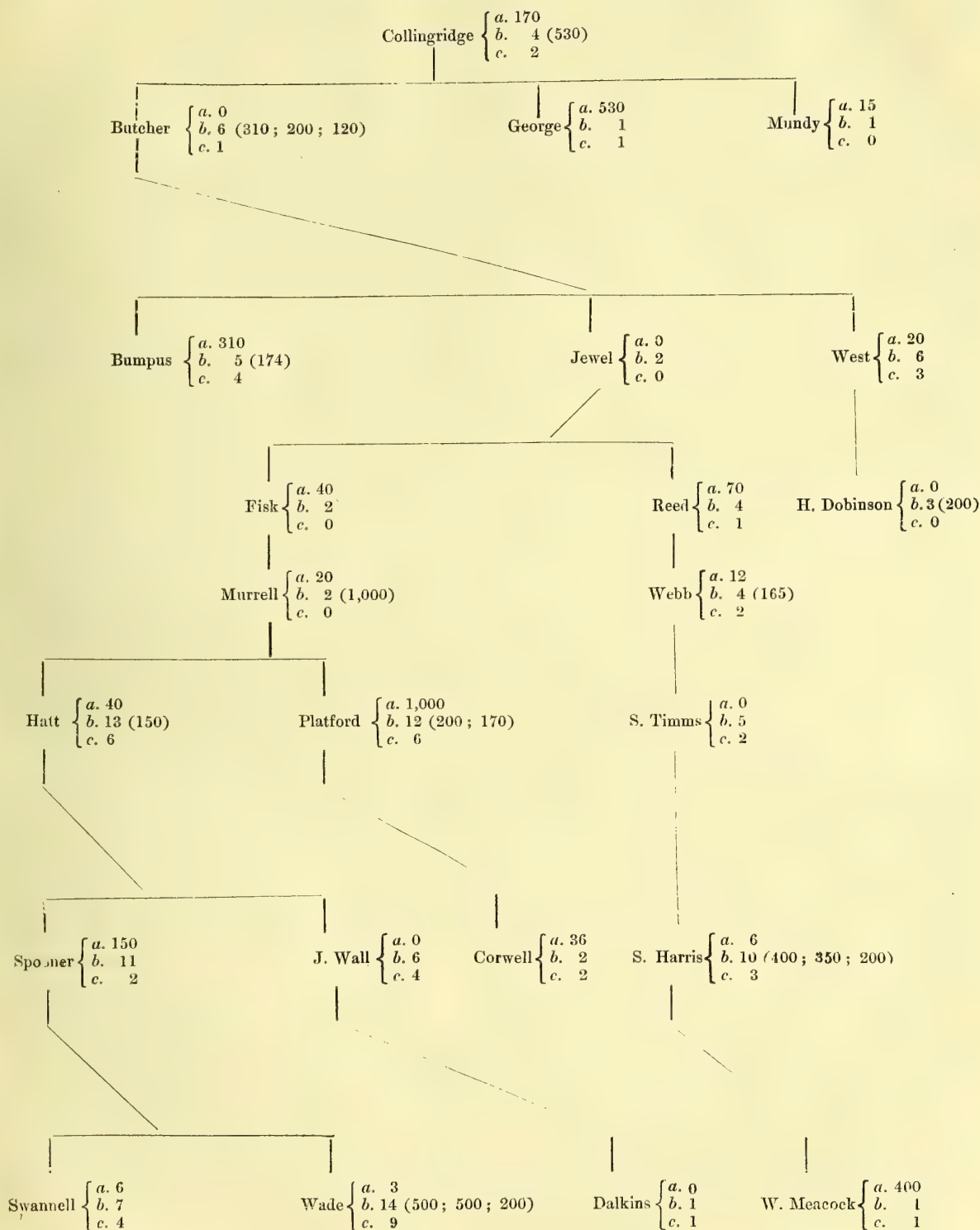


The figures against the names in the table below indicate :—

a.—The number of pustules appearing in the case itself.

b.—The number of cases done from the tumour on the arm of the case. (The figures in brackets giving the number of pustules, in the cases so done, in the instances where they exceeded one hundred.)

c.—The number of the above cases in which pustules were absent.



Further, while Collingridge's local tumour was the source of much of the lymph used or distributed by Woodville, it was not the only source. From the sores of the dairy-maid at the Gray's Inn Lane "dairy" five cases were inoculated. One of these (Crouch) had no eruptive pustules, and matter taken from his arm produced cow-pox in a cow belonging to Mr. Coleman; we may conclude that Crouch's case was one of veritable cow-pox. But Harris and Bunker, done on the same day, and with the same matter had eruptive pustules, the former 300, the latter only 3. These two cases, being inoculated for small-pox on the fifth day of the inoculation with cow-pox matter, are



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parallel to that of Collingridge. If their pustules were due to the second inoculation, they supply an argument of analogy in favour of Collingridge's pustules having a like origin. If we suppose, as the view concerning Collingridge which we are discussing supposes, these two cases were simply cases of small-pox, due to an unclean lancet being used, we are not only met with the difficulty of such an accident being repeated again twice so soon, but the far greater difficulty that the small-pox matter used, (and if separate lancets were used for each, the small-pox matter in each case might have had different origin,) "sported" again as it did in the case of Collingridge, and gave birth to a cow-pox like local tumour.

Further, from Coleman's cow, which we may assume to be veritable cow-pox, three cases were inoculated. Each of these had an abundant crop of pustules. If these pustules were due to an unclean lancet, as has been supposed in the case of Collingridge, we must repeat afresh the hypothesis of the small-pox matter "sporting"; and this on the doctrine of chances presents enormous difficulties. If the pustules had some other origin, (which in these three cases must have been natural contagion, since they were, not as was Collingridge, inoculated with small-pox early in the disease,) we must conclude that the local effect was a veritable cow-pox tumour. But these three cases especially one (Streton) were the origin of much of the lymph used (and presumably distributed) by Woodville. The series of cases proceeding from Streton's local tumour run closely parallel to the series proceeding from Collingridge, pustules appearing and disappearing in a like fitful irregular way. If Streton's series was one of cow-pox, it is very difficult indeed to suppose that Collingridge's series was one of small-pox.

Lastly it became early acknowledged in the practice of cow-pox inoculation that while cases with eruptive pustules were contagious, that is to say, produced a like disease by contact or proximity, cases without such pustules were not. (Woodville *Observ.*, p. 31. Fosbrooke; *Med. Phys.*, vol. III., p. 247.) Now it is true that some authors maintained that cases of inoculated small-pox showing the local pustule only were not contagious; but these authors had an ulterior reason for their contention, namely, their desire to prove that the practice of inoculation did not increase the prevalence of small-pox; and this lessens the value of their opinion. Even admitting that the contagion, itself, the *materies morbi*, is produced or contained in the pustules, and distributed from them, and that, therefore, a case with many pustules is more contagious, emits more "particles of contagion" than a case with few, and *à fortiori*, than one with the local tumour only, the evidence goes to show that no true case of inoculated small-pox should be considered free from contagion; this was the opinion of the inoculators and Dimsdale (*Op. cit.* p. 93, *see also* p. 39) quotes a case in point. The "sport" which the small-pox put on in the case of Collingridge must, therefore, according to the view which we are considering, have further simulated cow-pox in the loss of contagiousness. It is, of course, not possible outside Woodville's report to disentangle the cases derived from Collingridge from the cases having other sources; but unless all the other sources are like that of Collingridge, to be regarded as sports of small-pox, this very fact increases the difficulty of regarding Collingridge's case as being of that nature.

The supposition, then, that the local effect on Collingridge, called by Woodville a cow-pox tumour, was in reality a small-pox tumour of a special kind, lands us in an accumulation of difficulties. On the other hand, all difficulties, except the minor ones which we have discussed as presented by the details of Collingridge's case, vanish if we suppose that Woodville was right in calling the local effect a cow-pox tumour, and that the lymph taken from the local tumour used and distributed by him was vaccine lymph, and that where pustules did appear they were (putting aside the possibility of generalized vaccinia) pustules of accompanying small-pox introduced in some cases by premature inoculation, but in most cases by natural contagion.

This latter view explains why Woodville found no difference in his results at the Hospital between lymph of different sources, not only between that of Collingridge and the others on which we have dwelt, but also between these and the virus "produced in "different cows" procured by him "at various times"; he says (*Observations*, page 19) "the effects of all the matter I tried were perfectly similar, and pustules proved to be "not less frequently the consequence of these trials than of those made with the "matter formerly employed." This view also explains the contrast with which Woodville himself was struck, between the cases at the Hospital and cases away from the Hospital. At the beginning Woodville on several occasions used matter from the eruptive pustules, that is, small-pox matter, and it is very probable, as has been said, that some of the matter distributed from the Hospital, for instance, by



Pearson was taken from the eruptive pustules, and that in some of the cases outside the Hospital, in which an eruption of pustules was recorded, this matter was used. But the cases outside the hospital in which eruptive pustules appeared were exceptional. Woodville himself states that not only in the cases inoculated with the matter from Bumpus sent to Jenner, but in nearly all other instances the matter which in the Hospital continued to produce pustules, when sent abroad did not produce them. He mentions (*Observations*, 1800; page 21) as exceptions matter sent to a village where small-pox was raging and where one in five had pustules, and matter sent to Mr. Evans of Ketley, who, like Woodville, was carrying on cow-pox and small-pox inoculations at the same time in the same house, more than half of whose patients had pustules; he argues that the pustules were due, not to the nature of the lymph sent, but to the presence of small-pox in the localities.

Jenner, with what some might call rashness but others sagacity, maintained from the very first that the eruptive pustules were indications of small-pox. Woodville, as we have seen, at first believed that the eruptive pustules were a natural part of the malady, and spoke of the cases as being mild or severe according to the number of such pustules occurring. He held this view when he published his Reports in May 1799, and indeed three-fifths of the cases there recorded exhibited pustules, (in many of them, however, the matter used for inoculation was itself derived from the eruptive pustules). Writing in June 1799, that is a month later (*Med. Phys. Jl.* Vol. I., p. 417), he reports that out of 310 cases, subsequent to the Reports only 39 had pustules, the last 110 of these having pustules in 7 cases only. He says this confirms the opinion expressed in the Reports that matter taken from mild cases tended to produce mild cases, or that the disease actually became milder in its progress from patient to patient, that is to say, the very nature of the virus was affected by the mere transmission through a series of human beings. But he ends with a striking sentence that these cases lead "to a conclusion widely different from that published in the Reports." In his *Observations*, the Preface of which is dated July 1, 1800, in quoting 2,000 cases he states that "in the Hospital, however, the disease still continues to occasionally produce pustules, though not more than in the proportion of three or four cases out of a hundred." Six months later, December 1800 (*Med. Phys. Jl.*, Vol. V., p. 6), he speaks of the cases which had at the date of his last publication "received the vaccine infection" as exceeding 2,500, and says that since that time upwards of 1,500 have been inoculated for the cow-pox at the same place, and that "the number of pustular cases . . . has been even less than three or four out of a hundred." He now states that he is convinced that an eruption of variolous-like pustules "will be found to be a very rare occurrence unless previously to the vaccine inoculation, or during its local progress the patient has been exposed to the action of variolous matter." This probably "is the conclusion widely different from that published in the Reports," foreshadowed in his writing of June 1799; that is to say, he now abandons the view then expressed that the diminution of pustular cases is due to the selection of mild cases or to weakening by continued transmission.

Thus, though, as has been said, the occurrence of pustules was irregular in the cases recorded in the Reports, the absence of pustules occurring quite early in the series and being fitfully continued, so that they cannot be said to show a distinct progressive elimination of pustules there was in the subsequent cases, especially in the later of these, a distinct progress towards an absence of pustules. This might have been in part due to Woodville's abstaining from using the matter of the eruptive pustules, as well as from premature inoculation with small-pox, but could only in part have been so due. On the other hand, in the Hospital it was natural that pustules should be common so long as Woodville thought, as he did at first, that they formed a natural part of the disease, and that they should become less so soon as he became aware, as apparently he did so early as June 1799, that they were due to the patient being exposed to the action of variolous matter; so soon as he had grasped this view he would take care that those inoculated with cow-pox should be exposed as little as possible to the action of variolous matter, no care at all having been taken previously. The marked diminution of pustular cases coincides with Woodville's change of views.

Reviewing then all the evidence, no conclusion seems justifiable other than the one that all Woodville's and Pearson's cases (excluding of course all those in which the matter used was taken from the eruptive pustules and not from the local cow-pox) were cases of cow-pox, however much some of them might have been mixed up with small-pox.



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## APPENDIX II.

*Tables, furnished by the Registrar-General, showing for England and Wales :—*

*(A.) The deaths from small-pox at certain age-periods, to one thousand deaths from small-pox at all ages, in each year 1848–1894; and*

*(B.) The death-rates from small-pox, per million living at certain age-periods, in each year 1848–1894.*

*[N.B.—In both tables deaths returned as from chicken-pox are unavoidably included as regards the years 1848–1854 inclusive.]*

*(A.)—Deaths from small-pox at certain age-periods, to one thousand deaths from small-pox at all ages, in each year 1848–1894.*

| Year. | Under 1 Year. | 1–  | 5–  | 10– | 15– | 25– | 45 and upwards. |
|-------|---------------|-----|-----|-----|-----|-----|-----------------|
| 1848  | 235           | 457 | 130 | 37  | 72  | 58  | 11              |
| 1849  | 250           | 427 | 145 | 35  | 65  | 60  | 18              |
| 1850  | 268           | 432 | 133 | 35  | 65  | 55  | 12              |
| 1851  | 258           | 439 | 131 | 33  | 68  | 59  | 12              |
| 1852  | 267           | 426 | 122 | 32  | 75  | 62  | 16              |
| 1853  | 273           | 413 | 123 | 31  | 71  | 70  | 19              |
| 1854  | 203           | 388 | 128 | 31  | 108 | 107 | 35              |
| 1855  | 194           | 321 | 135 | 31  | 135 | 143 | 41              |
| 1856  | 231           | 329 | 122 | 40  | 134 | 108 | 36              |
| 1857  | 243           | 345 | 164 | 31  | 94  | 98  | 25              |
| 1858  | 234           | 319 | 173 | 39  | 105 | 106 | 24              |
| 1859  | 252           | 327 | 126 | 44  | 116 | 104 | 31              |
| 1860  | 232           | 324 | 112 | 42  | 121 | 132 | 37              |
| 1861  | 242           | 295 | 108 | 47  | 125 | 126 | 57              |
| 1862  | 231           | 328 | 110 | 45  | 122 | 125 | 39              |
| 1863  | 236           | 308 | 105 | 37  | 129 | 140 | 45              |
| 1864  | 243           | 312 | 105 | 37  | 119 | 140 | 44              |
| 1865  | 233           | 272 | 102 | 41  | 134 | 163 | 55              |
| 1866  | 222           | 320 | 99  | 32  | 136 | 146 | 45              |
| 1867  | 239           | 298 | 86  | 31  | 133 | 160 | 53              |
| 1868  | 239           | 351 | 102 | 31  | 115 | 123 | 39              |
| 1869  | 221           | 327 | 126 | 30  | 111 | 136 | 49              |
| 1870  | 179           | 284 | 143 | 38  | 140 | 170 | 46              |
| 1871  | 135           | 199 | 149 | 56  | 181 | 221 | 59              |
| 1872  | 137           | 162 | 164 | 66  | 191 | 214 | 66              |
| 1873  | 132           | 99  | 138 | 62  | 224 | 258 | 87              |
| 1874  | 129           | 100 | 107 | 70  | 263 | 258 | 73              |
| 1875  | 106           | 101 | 108 | 80  | 261 | 254 | 90              |
| 1876  | 119           | 135 | 108 | 67  | 214 | 286 | 71              |
| 1877  | 102           | 145 | 112 | 72  | 216 | 270 | 83              |
| 1878  | 119           | 135 | 117 | 77  | 213 | 255 | 84              |
| 1879  | 116           | 127 | 119 | 63  | 187 | 265 | 123             |
| 1880  | 120           | 142 | 117 | 76  | 196 | 267 | 82              |
| 1881  | 103           | 136 | 109 | 68  | 205 | 276 | 103             |
| 1882  | 98            | 111 | 77  | 61  | 226 | 325 | 102             |
| 1883  | 131           | 104 | 95  | 62  | 239 | 262 | 107             |
| 1884  | 114           | 116 | 92  | 71  | 214 | 302 | 91              |
| 1885  | 120           | 126 | 79  | 63  | 185 | 312 | 115             |
| 1886  | 113           | 80  | 65  | 40  | 189 | 313 | 200             |
| 1887  | 121           | 73  | 61  | 61  | 283 | 328 | 73              |
| 1888  | 119           | 81  | 63  | 49  | 230 | 329 | 129             |
| 1889  | 86            | 43  | —   | 43  | 261 | 437 | 130             |
| 1890  | 188           | 63  | —   | —   | 188 | 373 | 188             |
| 1891  | 246           | 102 | 61  | 61  | 82  | 285 | 163             |
| 1892  | 117           | 148 | 77  | 9   | 132 | 359 | 158             |
| 1893  | 141           | 142 | 66  | 30  | 110 | 305 | 206             |
| 1894  | 140           | 133 | 45  | 28  | 143 | 367 | 144             |

Chicken-pox unavoidably included in the years 1848–1854 inclusive.



(B.)—*Death-rates from small-pox, per million living at certain age-periods, in each year 1848–1894.*

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| Year. | All ages. | Under 5 years. | 5–10 years. | Total under 10 years. | 10–15 years. | 15–25 years. | 25–45 years. | 45 years and upwards. |
|-------|-----------|----------------|-------------|-----------------------|--------------|--------------|--------------|-----------------------|
| 1848  | 397       | 2,090          | 439         | 1,311                 | 135          | 149          | 86           | 23                    |
| 1849  | 264       | 1,364          | 326         | 874                   | 86           | 90           | 59           | 26                    |
| 1850  | 262       | 1,400          | 298         | 881                   | 86           | 89           | 54           | 18                    |
| 1851  | 389       | 2,066          | 438         | 1,299                 | 121          | 139          | 86           | 25                    |
| 1852  | 401       | 2,117          | 420         | 1,319                 | 119          | 158          | 93           | 34                    |
| 1853  | 171       | 892            | 180         | 558                   | 50           | 64           | 45           | 17                    |
| 1854  | 151       | 675            | 165         | 436                   | 44           | 86           | 61           | 28                    |
| 1855  | 131       | 512            | 151         | 343                   | 39           | 93           | 70           | 28                    |
| 1856  | 116       | 491            | 122         | 318                   | 44           | 82           | 47           | 22                    |
| 1857  | 202       | 891            | 283         | 607                   | 59           | 100          | 75           | 27                    |
| 1858  | 330       | 1,364          | 489         | 956                   | 121          | 185          | 132          | 42                    |
| 1859  | 193       | 835            | 208         | 543                   | 82           | 119          | 76           | 31                    |
| 1860  | 136       | 564            | 130         | 362                   | 54           | 87           | 67           | 27                    |
| 1861  | 64        | 256            | 59          | 165                   | 28           | 43           | 30           | 19                    |
| 1862  | 78        | 322            | 73          | 206                   | 33           | 50           | 37           | 16                    |
| 1863  | 286       | 1,153          | 255         | 735                   | 101          | 198          | 151          | 67                    |
| 1864  | 364       | 1,500          | 325         | 953                   | 126          | 232          | 193          | 83                    |
| 1865  | 301       | 1,127          | 260         | 723                   | 117          | 217          | 187          | 86                    |
| 1866  | 139       | 558            | 117         | 352                   | 41           | 102          | 78           | 33                    |
| 1867  | 114       | 453            | 82          | 280                   | 33           | 82           | 69           | 31                    |
| 1868  | 91        | 396            | 78          | 247                   | 27           | 56           | 43           | 18                    |
| 1869  | 67        | 271            | 71          | 177                   | 19           | 40           | 35           | 17                    |
| 1870  | 113       | 388            | 136         | 270                   | 40           | 86           | 74           | 27                    |
| 1871  | 1,012     | 2,502          | 1,265       | 1,922                 | 529          | 994          | 860          | 306                   |
| 1872  | 821       | 1,815          | 1,130       | 1,494                 | 503          | 851          | 676          | 279                   |
| 1873  | 98        | 167            | 114         | 142                   | 57           | 119          | 98           | 44                    |
| 1874  | 88        | 148            | 79          | 116                   | 57           | 125          | 87           | 34                    |
| 1875  | 35        | 54             | 32          | 44                    | 26           | 49           | 35           | 16                    |
| 1876  | 99        | 185            | 89          | 140                   | 62           | 113          | 108          | 37                    |
| 1877  | 173       | 316            | 161         | 243                   | 116          | 201          | 180          | 76                    |
| 1878  | 74        | 139            | 72          | 108                   | 53           | 85           | 73           | 33                    |
| 1879  | 21        | 38             | 21          | 30                    | 12           | 21           | 22           | 14                    |
| 1880  | 25        | 49             | 24          | 37                    | 18           | 26           | 26           | 11                    |
| 1881  | 119       | 210            | 107         | 161                   | 75           | 130          | 127          | 65                    |
| 1882  | 50        | 78             | 32          | 56                    | 28           | 60           | 63           | 27                    |
| 1883  | 36        | 64             | 28          | 47                    | 20           | 46           | 36           | 20                    |
| 1884  | 83        | 145            | 63          | 106                   | 54           | 93           | 96           | 40                    |
| 1885  | 104       | 197            | 69          | 136                   | 60           | 101          | 123          | 63                    |
| 1886  | 10        | 15             | 5           | 19                    | 4            | 10           | 12           | 11                    |
| 1887  | 18        | 28             | 9           | 19                    | 10           | 27           | 23           | 7                     |
| 1888  | 36        | 58             | 19          | 39                    | 16           | 44           | 45           | 25                    |
| 1889  | 0.8       | 0.8            | —           | 0.4                   | 0.3          | 1.1          | 1.3          | 0.6                   |
| 1890  | 0.6       | 1.1            | —           | 0.6                   | —            | 0.5          | 0.8          | 0.5                   |
| 1891  | 1.7       | 4.8            | 0.9         | 2.7                   | 0.9          | 0.7          | 1.8          | 1.4                   |
| 1892  | 15        | 32             | 10          | 21                    | 1            | 10           | 20           | 12                    |
| 1893  | 46        | 105            | 26          | 67                    | 12           | 26           | 52           | 49                    |
| 1894  | 27        | 61             | 11          | 36                    | 7            | 20           | 38           | 21                    |

Chicken-pox unavoidably included in the years 1848–1854 inclusive.



## Statement by Dr. Collins and Mr. Picton of the Grounds of their Dissent from the Commission's Report.

1. We entirely agree with the Report of our colleagues in so far as it shows the great change of professional and scientific opinion since vaccination first engaged the attention of the Legislature, and since the passing of the first compulsory Act in 1853. We hold with them that the prophylactic power of vaccination has been at least exaggerated, and that dangers incidental to the practice, though at one time denied, "are undoubtedly real and not inconsiderable in gross amount." We gladly added our signatures to theirs in support of the Commission's interim report recommending the abolition of repeated prosecutions, and also that recalcitrants against the vaccination laws should no longer be subjected to the same treatment as criminals. We now desire also, if compulsion in any form is to be maintained, to support their final recommendations for the relief of conscientious nonconformity with the law. We also gladly endorse the precautions they recommend with the object of preventing avoidable dangers in connexion with the operation. There is no difference among us on these points; so far as these recommendations go the Commission is absolutely unanimous. We feel, however, that the evidence not only justifies but requires a more complete reconsideration of the present state of the law as well as of the methods adopted in dealing with small-pox. For this purpose it is necessary to review in some detail the history of small-pox and the various preventive measures which have at different times been in vogue, and to scrutinise the grounds on which one alone of these preventive measures has been relied upon to the exclusion of others. We desire also to give reasons for thinking that other more effective and practicable (as well as less objectionable) modes of stamping out small-pox, or protecting communities from its introduction, are available. We venture to think that the report of our colleagues, in the preparation of many portions of which we have borne our part, has approached the consideration of the behaviour of small-pox, and the means of preventing it, too exclusively from the standpoint of vaccination, and that too little attention has consequently been accorded to sanitary organisation, prompt notification and isolation, measures of disinfection and cleanliness, and healthy conditions of living, which we believe to be of the first importance in preventing and controlling outbreaks of small-pox.

*Reference I.—The effect of vaccination in reducing the prevalence of, and mortality from, small-pox.*

2. The origin and antiquity of small-pox are involved in obscurity. No account of the disease appears in the writings of Hippocrates or Galen; it seems to have been unknown in ancient Greece and Rome. Unambiguous evidence of its presence on the Continent of Europe is to be found in the 15th century, and scattered references of more debatable character may be found in the two previous centuries.

Small-pox, like the plague and some other infectious maladies, appears to have, as it were, its habitat in certain countries, and its diffusion thence results from importations under favourable circumstances of the morbid poison by infected persons or things. Such native foci of small-pox are said to be the countries of Central Africa and India.

3. The first extant work on small-pox is by an Arabian physician, Rhazes of Bagdad, written in the 10th century A.D. His account of the disease was so accurate and complete that it served as a model for many medical writers when the disease became common in Europe.

4. Various theories of the cause of small-pox were advanced in mediæval writings, but contagion, though referred to by some of the earlier Arabian authors, was not thought to be of importance. No doubt small-pox was often confounded with other eruptive diseases, such as measles, and even as late as 1700 these were classed together in Bills of Mortality. Sydenham (1624–89) described fully the small-pox as it occurred in London in the 17th century. He emphasised the distinction between small-pox and measles, and introduced the "cool treatment" for these diseases. He describes small-pox as prevailing epidemically, attacking persons of all ages, varying greatly in its severity; the mortality being in his opinion largely augmented by mischievous treatment. Sydenham, like his contemporaries, did not attribute the propagation of small-pox to



contagion, but to what he termed the “epidemic constitution of the atmosphere” due to “certain hidden and inexplicable changes within the bowels of the earth.”

5. It was reserved for Boerhaave, of Leyden (1668–1738), to proclaim the view, now generally accepted, that small-pox arises only from contagion.

6. During the 17th century small-pox became more prevalent in Western Europe, especially in large towns and trading ports. It was introduced into Boston (U.S.A.) early in the century; and on numerous occasions epidemics in the West Indies and South America have been traced to slave importations from Africa. On the other hand it appears that places and countries naturally isolated, or removed from the more populous centres of human intercourse, then, as now, enjoyed complete or comparative immunity from the disease. Thus the Farøe Islands were first infected by a ship from Denmark in 1651, Cape Colony in 1713 by a ship from India, while the continent of Australia, it is stated, enjoyed an absolute immunity until 1838, and the island of Tasmania continued to be exempt until 1887.

7. In view of the curious notions entertained by the most learned medical writers in the 17th century as to the propagation of small-pox, and the superstition with which an epidemic was regarded by the common folk, it is not surprising that the century closed without any effort being made to protect individuals or communities from this disease. In London the ravages of the Plague until its extinction in 1680 appear to have eclipsed the lesser evils of the small-pox, and to have absorbed whatever of organised effort was available on the part of those responsible for the public health.

8. The London Bills of Mortality were first compiled by the parish clerks in 1629, and though the data they furnish in regard to the deaths from various diseases cannot be regarded as even approaching to scientific accuracy, they give some idea of the health, or rather of the unhealthiness, of 17th century London.

ANNUAL DEATH RATES in LONDON per 100,000 living.

| Causes of Death. |   |   | 1629–35. | 1660–79. |
|------------------|---|---|----------|----------|
| All causes       | - | - | 5,000    | 8,000    |
| Plague           | - | - | 125      | 1,225    |
| Fever            | - | - | 636      | 785      |
| Small-pox        | - | - | 180      | 417      |

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App., p. 88.

There can be no doubt that the conditions which obtained in London “within the “Bills” during the 17th century were in the highest degree favourable to the propagation of pestilential diseases. The general death rate was enormously high, and though plague disappeared soon after the Great Fire, fevers and small-pox became more severe and fatal and were perennially endemic.

9. Not only were the insanitary conditions which prevailed well calculated to foster and perpetuate any infection which happened to be introduced, but owing to the non-recognition of the part played by contagion in the dissemination of these diseases, the latter were accepted as well nigh inevitable evils, and no effort was made to restrict their ravages.

11,004.

10. In 1710, for the first time since the Bills of Mortality had been compiled, more than 3,000 deaths were ascribed to small-pox in London, or 127 per 1,000 deaths from all causes. The prevalence of the disease led to many speculations as to possible means of deliverance from it. The orthodox teaching of propagation by “epidemic constitution of the atmosphere” was not calculated to inspire sanitary precautions, or the separation of the sick from the whole. Mead’s work on the prevention of contagions, primarily directed against a threatened invasion of plague, was not written until 1720. On the other hand there were reports from the Levant, where small-pox had been long endemic, that by a method of “engrafting” the disease artificially it might be robbed of its terrors. As far as the epidemiological history of small-pox can be followed back in Asia and Africa, we find records of the popular practice in some form or other, and often with religious associations, of the artificial induction of the disease. Even in Wales and Scotland, and in Western Europe, some kind of popular tradition of a similar practice has been traced by some authorities.

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p. 400.  
10,332–  
10,335.  
107–  
10,340.

11. Whatever credit may attach to the introduction of the practice of inoculation into this country is, however, due to Lady Mary Wortley Montagu. During her residence at Pera, while her husband was Ambassador to the Porte, Lady Mary learnt that it was there the fashion “to take small-pox by way of diversion as they take the waters



“ in other countries.” In a letter, dated 1717, she announced her intention of submitting her son, aged five, to the operation, and added, “ I am patriot enough to “ take pains to bring this useful invention into fashion in England.” Her son was accordingly inoculated by a Greek woman, under the supervision of Mr. Charles Maitland, Surgeon to the Embassy, and he passed favourably through the disease. Lady Mary returned to London, and in the spring of 1721 had her younger child inoculated by Maitland. The operation, which was satisfactory, was witnessed by three physicians, as well as several ladies and persons of distinction. In August 1721 inoculation was tried experimentally on six criminals at Newgate, and the practice was encouraged by the Court.

12. While the effects in most of the early cases appear to have been mild, a few terminated fatally, and the practice became for a while less popular. After 1740, however, inoculation was revived, and, in the modified form of Dimsdale and Sutton, was widely adopted in many parts of the United Kingdom. In 1746 an inoculation hospital was started in London, and in most of the large provincial towns the new practice was encouraged by the clergy, as well as the leading medical practitioners, “ and in 1754 the Royal College of Physicians of London pronounced its authori-  
“ tative sanction of what was “ no longer a speculative novelty.” The resolu-  
“ tion of the College was:—“ The College, having been informed that false reports  
“ concerning the success of inoculation in England have been published in foreign  
“ countries, think proper to declare their sentiments in the following manner, viz. :—  
“ That the arguments which at the commencement of this practice were urged against  
“ it have been refuted by experience ; that it is now held by the English in greater  
“ esteem, and practised among them more extensively than ever it was before ; and  
“ that the College thinks it to be highly salutary to the human race.” From this date to the end of the century inoculation was widely diffused, though to varying degrees, in different districts ; the practice doubtless paved the way for the later acceptance of vaccination. The latter came to replace the former method, and by the Act of 1840, sec. 8, the practice of inoculation became a penal offence.

13. Now the practice of inoculation was based on the belief that one attack of small-pox protected from subsequent attack those who recovered. And it was argued that the artificially-inoculated disease, though usually far less severe than the natural disease, yet afforded a similar immunity. It is neither necessary nor profitable to discuss at any length the various theories that have been advanced to account for such immunity ; suffice it to say there exists, and has always existed, a belief, shared by medical writers, that in the case of many infectious diseases one survived attack affords a certain amount of protection against a second attack. We are not aware of any large body of statistical evidence which can be cited in support of the general statement ; but the belief is held by those most conversant with the facts, and has been insisted on most strongly in the case of small-pox. It has been stated that second attacks of such diseases, when they do occur, are more severe than the first, and there is, so far as we know, no ground for asserting that second attacks of infectious diseases are in any way mitigated in severity by the abiding influence of the first attack.

14. The earlier writers on small-pox appear to have held that second attacks of the disease undoubtedly occurred and not unfrequently. The view that second attacks of small-pox occurred was held by Sydenham, also by Diemerbroek who observed that the eruption was more severe in second attacks than the first. The case of Louis XV. has been often quoted ; he had a first attack at 14, and died of a second attack at 64. During the inoculation period the possibility of second small-pox was emphatically denied by several writers. After the introduction of vaccination the controversy which took place over its relative merits when compared with those of inoculation brought to light numerous instances of second small-pox in the same individual. Jenner collected more than a thousand cases of the kind. Moore says, “ For some years the periodical and  
“ other medical publications teemed with cases of small-pox occurring twice.” At the present time cases of second attacks of the disease are usually met with in every outbreak of any extent, and it would seem reasonable to conclude that the protection afforded by a previous attack, though considerable, is by no means absolute. Moreover, experience, though of limited amount, appears to show that no mitigating influence is exerted by the first upon a second attack should it occur.

15. Notwithstanding the extensive practice of inoculation, or, as has been alleged, in consequence of it, small-pox continued throughout the 18th century to be endemic in London, and severely epidemic, often at frequent interval in many towns and villages in this country and abroad. During the latter half of the century attention was called by many writers to the serious evil to society of partial and

Vol. 1, p. 66.

4545.  
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indiscriminate inoculation. It was shown that, whatever advantages might result to the inoculated by way of protection from attack, the practice had frequently been the means of introducing the disease into towns and villages that were previously free from it, and that it could only be worked at an intolerable cost of life. Vol. 1, App., p. 66.

16. Attention was also, about this time, called to the restrictive influence which might be exerted upon outbreaks of small-pox by separating the sick from the healthy. The part played by contagion in the propagation of epidemics had, since the adoption of inoculation, come to be clearly recognised, and measures were suggested for stamping out small-pox on the lines of methods employed against the plague. Rast. Faust. 11,015. Haygarth. Dimsdale, 1105.

Some, like Haygarth, suggested the combination of general and systematic inoculation at stated intervals with measures of isolation. Others, like Rast, Faust, and Cappel, advocated hospital isolation of the infected, and regarded inoculation as not only superfluous, but dangerous, and opposed in principle to the proper method of exterminating the infectious poison. 10,796-10,969.

17. It was at this juncture that the value of the cow-pox as a protection against small-pox attracted attention. It could be inoculated, like the small-pox, from one person to another, but unlike the latter it was stated to be not communicable by infection. If it afforded protection against small-pox without spreading the disease, opinion was evidently ripe for the substitution of the one practice for the other, for inoculation had come to be regarded about this time, not merely as a troublesome affair to those who submitted to it, but as a serious evil to society. Henceforth the controversy over the cow-pox absorbed almost exclusively the attention of those concerned for the prevention of small-pox, and for a long while little was heard of any means other than vaccination, such as isolation, &c., for the suppression or restriction of the disease. 10,803.

18. From such records and statistics as are available it would appear that small-pox was more prevalent and the mortality from it was greater, especially in large towns, during the 18th century than it had been in the 17th. It is also true that, speaking broadly, the present century compares favourably with the last; the disease has not been the scourge that it then was. Prior to 1838, when official registration of the causes of death in this country began, the longest series of figures, and those which have been most often quoted, are the London Bills of Mortality. The following figures are taken from a table put in by Sir J. Simon, which was compiled by Dr. Farr, with due regard to the many sources of error which these Bills admittedly contain:— Vol. 1, App. p. 66.

ANNUAL DEATH RATES in LONDON per 100,000 living at SEVEN DIFFERENT PERIODS during the YEARS 1629-1835, from—

| —       | All Causes. | Small-pox. | Fever. |
|---------|-------------|------------|--------|
| 1629-35 | 5,000       | 180        | 636    |
| 1660-79 | 8,000       | 417        | 785    |
| 1728-57 | 5,200       | 426        | 785    |
| 1771-80 | 5,000       | 502        | 621    |
| 1801-10 | 2,920       | 204        | 264    |
| 1831-35 | 3,200       | 83         | 111    |

There was evidently a great improvement in the health of London, as measured by the fall of the death-rate from all causes, from its highest point in the Plague period, to a rate of about one half or one third of what it had been. A great improvement took place between the middle of last century and the earlier years of the present. Dr. Farr, remarking on these figures, says:—

“The diseases of London in the 16th century still prevail in unhealthy climates; not only the diseases and the manner of death have changed in this metropolis, but the frequency and fatality of the principal diseases have diminished.”

“Small-pox attained its maximum mortality after inoculation was introduced. The annual deaths of small-pox registered 1760-79 were 2,323; in the next 20 years, 1780-99, they declined to 1,740; this disease, therefore, began to grow less fatal before vaccination was discovered; indicating, together with the diminution of fever, the general improvement of health then taking place. In 1771-80 not less than 5 in 1,000 died annually of small-pox; in 1801-10 the mortality sank to 2, and in 1831-5 to 0·83.”



“Fever, exclusively of the plague, has progressively subsided since 1771: *fever has declined nearly in the same ratio as small-pox*. In the three latter periods of the table the deaths from fever decreased as 621:264:111; from small-pox as 502:204:83.”

19. We think these figures suggest that the fall of the death rates from fever and small-pox were associated in cause as well as in time with the improvement in the public health which the fall in general mortality indicates. It is possible that inoculation as practised in London in the latter part of last century, prevented an earlier or greater reduction in small-pox than actually took place. Among the influences at work in the last quarter of the 18th century which would tend to counteract any injurious influence of inoculation were the progressive rooting out of small-pox from our prisons, the sanitary improvements in our towns, the growth of what has been termed the “new humanity,” which made the care of the sick and the protection of the public health against noxious agencies matters of public concern and active philanthropy, influences for good with which the names of Howard and of Cook and of Haygarth are honourably and eternally associated.

Since Dr. Farr compiled the figures which we have quoted above, we have five completed decades of registration statistics, and extracting for London the death rates to the same scale from all causes, from small-pox, and from fever we obtain the following:—

ANNUAL DEATH RATES in LONDON per 100,000 living from:—

| —       | All Causes. | Small-pox. | Fever. |
|---------|-------------|------------|--------|
| 1841-50 | 2,500       | 40         | 97     |
| 1851-60 | 2,400       | 28         | 88     |
| 1861-70 | 2,400       | 27         | 90     |
| 1871-80 | 2,240       | 45         | 37     |
| 1881-90 | 2,037       | 14         | 21     |

20. Objection has been taken to a comparison between fever and small-pox when endeavouring to decide what has been the influence of the various agencies collectively spoken of as “sanitation” upon either, on the ground that the term fever has varied in its signification, and that measles and whooping-cough should be therefore used instead for such comparison. We cannot agree with this view; our knowledge of the history, epidemiology, and behaviour of measles and whooping-cough does not suggest to us that they have hitherto been very amenable to sanitary reforms, or that they present an analogy with small-pox, like the fevers and especially typhus fever. As regards the objection that the nomenclature has varied, it appears that Dr. Greenhow and Dr. Farr, in the figures which Sir J. Simon quotes from them, paid particular attention to this source of fallacy, thus the former writer, “throwing into one group all those deaths of the present day which might have been included under the old application of the word ‘fever’ (counting scarlet fever, and inflammation of the brain, and inflammation of the lungs in this category), still finds that even with this large addition the so-called ‘fever’ of the present day occasions only a death rate of 385 per 100,000, whereas a century ago its death-rate was close on 539.”

21. But since 1869 the Registrar-General has separately distinguished deaths from typhus, typhoid, and simple fever, and we find that the decline has not been at the expense of one of these classes only, but has been shared by all.

The 42nd report of the Registrar-General, p. xxx, says: “Had the deaths from one or more of this group (fever) of causes fallen, while those from others in the same group had risen; or had the fall been trifling; or the totals dealt with insignificant in amount; it might have been suspected that the alteration was a mere alteration of name. But as the deaths under each heading have declined; as the fall in the death rate from them has been enormous, 62·4 per cent. in the course of 10 years; and as the totals are by no means small; it may be accepted as an indisputable fact that there has in truth been a notable decline in these pests, and it may be fairly assumed that the decline is due to improved sanitary organisation. The deaths from these causes, per million persons living, were 850 in 1869, and only 320 in 1879.”



ANNUAL DEATH RATES per MILLION living (ENGLAND).

| —       | Typhus. | Typhoid. | Simple Fever. |
|---------|---------|----------|---------------|
| 1871-5  | 81·4    | 373·8    | 140·2         |
| 1876-80 | 34·2    | 277·2    | 69·2          |
| 1881-85 | 22·8    | 216·0    | 34·2          |
| 1886-90 | 6·6     | 179·2    | 16·6          |

We are, therefore, led to the conclusion that the great fall in the fever death rate <sup>352, 354,</sup> since the middle of last century in London is a real and substantial one, that it is in <sup>382.</sup> all probability due to greater sanitary activity, and that a fall of about the same amount has during the same period taken place in small-pox mortality, and we are unable to agree that it is not largely due to similar causes.

22. The infectious nature of the inoculated small-pox came as a surprise to the first <sup>10,551.</sup> inoculators in England; but it was not long before the practice was accused of introducing and spreading the disease. Thus Dr. Wagstaffe, writing in 1722, instanced an occurrence in the town of Hertford, where, in consequence of a few inoculations, the small-pox had spread and occasioned a considerable mortality. (Moore's "History of Small-pox," p. 242.) Moore, alluding to these occurrences, remarks (p. 233) that they should have "induced the profession to pause ere they proceeded, or at least to have " prompted them never to inoculate without adequate measures being adopted to " prevent the infection spreading to others. The neglect of this easy precaution has " occasioned the loss of millions of lives." Statistics prepared by Dr. Jurin and others, appeared to prove the advantages of inoculation to those who received it, but Moore, alluding to Jurin's calculations, said (p. 243, "History of Small-pox"):—"These proved that an individual who resided in London, or in any large city " where the small-pox prevailed, had a much better chance of surviving that disease by " being inoculated; but they did not apply to the country, or to places where the " small-pox was infrequent. And, as in the year 1723, a great increase of the " mortality by small-pox took place in London; Dr. Jurin expressed his opinion that " this ought not to be imputed to inoculation, as the numbers who had been inoculated " in town that year did not exceed 60. This was a very inadequate answer; a single " person may bring the Plague into a town, or into a nation, and be the cause of the " destruction of an innumerable multitude. The small-pox is fully as infectious a " disease as the Plague, and sixty inoculations were more than sufficient to account " for the augmented mortality, and were probably the real cause of it." Without accepting this opinion we are nevertheless satisfied that inoculation did tend to establish and spread the disease, and introduce it into places which would probably have otherwise remained free, and that in places where it was restricted a less mortality resulted. It is also doubtless true that inoculation by opening up a new line of thought as to the preventibility of disease, paved the way for the subsequent reception of vaccination, and at the same time the knowledge that disease could be thus propagated at pleasure must have suggested the possibility of its being controlled at will. To the continuance and universal acceptance of Sydenham's doctrine of "epidemic constitution of the " atmosphere," Haygarth attributed the persistence of small-pox. <sup>10,738.</sup>

23. We also learn on the authority of Haygarth how great was the contrast, in respect of small-pox prevalence, between towns and country districts. Thus, in Kent, where inoculation was cautiously avoided, he quotes figures to show that last century the annual small-pox mortality did not exceed one in 20,000. From Sussex, too, he had evidence pointing to a similar experience. Writing in 1793, he adds, "How far this wonderful " exemption from the mortality of the distemper extends through the South of England " I cannot determine. The facts here related in regard to both Kent and Sussex are " taken by accident, and I have no reason to believe them extraordinary in these counties. " But no fact in any degree similar to them can be produced in this neighbourhood " (Chester), nor probably in any other where inoculation is freely allowed, and where, " at the same time, the casual contagion is permitted to make its destructive progress " without any kind of interruption. If the feeble, irregular, unconnected, and un- " authorised efforts of individuals can prevent so much mischief, *how much more " benefit might reasonably be expected from the united, systematic, and concerted regulations " of the whole island aided and strengthened by legal premiums and punishments.*" (Italics ours.)

In 1763 small-pox was unusually severe in Paris, and upon inquiry it was determined that this was owing to increased infection from inoculation, a decree was accordingly



issued prohibiting the practice in that city. It is stated by Moore and others that in Spain inoculation never became a general practice, and that no other country in Europe last century suffered so little from small-pox.

24. In estimating the influence of the practice of inoculation on the amount of and mortality from small-pox in a community regard must be had, to several factors. If we accept the common view that one attack of the disease, though artificially administered, affords a considerable amount of immunity against a future attack, though perhaps not influencing the severity should such attack occur, the universal practice would, in view of the usually greater mildness of the inoculated disease, determine a low small-pox death rate. Inasmuch as such universality of the practice never was and never could be attained, the extent to which it failed ensured (except in the rare cases where special isolation of the inoculated was secured) the constant presence of infected persons who were centres of contagion to the susceptible. There is plenty of evidence, not only last century but of more recent dates that inoculation has been the means of introducing and spreading small-pox in localities where the population was largely composed of susceptible persons. The effect of inoculation would in any particular time or place depend not only on the proportion of the inoculated to the susceptible, but also on the condition of things obtaining as regards the diffusion of the contagion independently of this particular mode of its propagation. Thus, if through habitual disregard of contagion small-pox patients were suffered to mix freely with those liable to the disease, the effect of any such superadded source of contagion as inoculation might well be inconsiderable. In a town where the disease had been long naturalised, and no particular measures taken to prevent it, we should not expect to find a very marked augmentation of the disease by even the partial practice of inoculation. In the case of isolated towns or villages removed from the more populous centres of human intercourse, and in which accordingly small-pox came rarely and epidemically, the introduction of inoculation might be expected to establish and spread the disease. Moreover, the habitual and systematic carrying on of the practice, without precautions, in a large town by ensuring the endemicity of the disease, and, as it were, making it indigenous, would in the case of small-pox tend to mask and obscure any influences at work of a countervailing character as regards the public health.

25. This is in fact what we find when we examine such figures as are available for determining the influence of inoculation on the prevalence of and mortality from small-pox, as, for instance, the London Bills of Mortality. Whether we consider the horribly insanitary conditions with the attendant overcrowding, or the disregard of precautions against contagion, it would probably be difficult to conceive conditions more favourable to the spread and fatality of small-pox than those which obtained in London in the first three quarters of last century. In this respect it is probable London was as bad as or even worse than other large European towns. Small-pox and other infectious fevers were allowed to run riot, and Bernouilli's calculation, derived from the experience of such places at such times, to the effect that 60 per cent. of those born took small-pox was probably not far wrong. The introduction of even partial and indiscriminate inoculation was not likely to, and in fact did not, increase to the extent which might otherwise have been expected the heavy toll that small-pox already exacted. Thus the figures from the London Bills show that in the first quarter of the 18th century, when inoculation had scarcely begun to be practised in London, the deaths from small-pox were 44,306 out of 586,270 total deaths, or 7·6 per cent. In the following quarter, when a certain amount of inoculation was carried on, especially towards its close, small-pox was responsible for 49,941 deaths out of 660,800, or again 7·6 per cent. In the third quarter, when inoculation had become an established custom, 56,690 out of 549,891 deaths, or 10·3 per cent., were ascribed to small-pox. In the last quarter of the 18th century, although the total deaths had greatly fallen, under the influences to which we have already alluded, the deaths from small-pox still constituted 9·2 per cent. of the whole (45,428 out of 493,309). It cannot be denied that the proportion of small-pox deaths to deaths from all causes was greater last century in London after the introduction of inoculation than it was before, though it is also true that the death rate in proportion to the estimated population from all causes and from small-pox showed signs of improvement during the last quarter of the 18th century.

26. The Committee of the House of Commons which reported on Jenner's petition stated:—"As a comparison between this new practice and the inoculated small-pox forms a principal consideration in the present inquiry, some facts with regard to the latter engaged the attention of your Committee, and in the supplement are inserted statements of the mortality occasioned by the small-pox in 42 years before inoculation was practised in England, and of the 42 years from 1781 to 1772; the result of which

0,492.  
886-7.  
182-1.  
128.

11,004.



“ appears to be an increase of deaths amounting to 17 in every 1,000; the general  
 “ average giving 72 in every 1,000 during the first 42 years, and 89 in the 42 years  
 “ ending with 1772, so as to make the whole excess of deaths in the latter period 1,742.  
 “ The increase of mortality is stated by another witness (No. 10) to be as 95 to 74,  
 “ comparing the concluding 30 years with the first 30 of the last century, and the  
 “ average annual mortality from small-pox to have been latterly about 2,000; for  
 “ though individual lives are certainly preserved, and it is true that a smaller loss  
 “ happens in equal numbers who undergo the small-pox now than there was formerly,  
 “ yet it must be admitted that the general prevalence of inoculation tends to spread  
 “ and multiply the disease itself; of which, though the violence be much abated by  
 “ the present mode of treatment, the contagious quality remains in full force.”

27. Calculations made by de Haen, Rast, Heberden, and others confirmed the belief  
 that inoculation, as practised in London, kept going a constant source of contagion and  
 increased the prevalence of small-pox. Dr. Heberden, writing in no controversial spirit,  
 thus summed up the case in 1801:—“ The inoculation of the small-pox having been  
 “ first used in England since the beginning of the eighteenth century, and having  
 “ been now for many years generally adopted by all the middle and higher orders of  
 “ society, it becomes an interesting inquiry to observe, from a review of the last  
 “ hundred years, what have been the effects of so great an innovation upon the  
 “ mortality occasioned by that disease. But, however beneficial inoculation prove to  
 “ individuals, or indeed to the nation at large, the Bills of Mortality incontestably  
 “ show that in London more persons have died of the small-pox since the introduction  
 “ of that practice. The poor, who have little care of preserving their lives beyond  
 “ the getting their daily bread, make a very large part of mankind. Their prejudices  
 “ are strong, and not easily overcome by reason. Hence, while the inoculation of the  
 “ wealthy keeps up a perpetual source of infection, many others, who either cannot  
 “ afford or do not choose to adopt the same method, are continually exposed to  
 “ the distemper. And the danger is still increased by the inconsiderate manner in  
 “ which it has lately been the custom to send into the open air persons in every stage  
 “ of the disease, without any regard to the safety of their neighbours. It is by these  
 “ means that, while inoculation may justly be esteemed one of the greatest improve-  
 “ ments ever introduced into the medical art, it occasions many to fall a sacrifice to  
 “ what has obtained the distinction of the natural disease. This must always be an  
 “ objection against making any great city the place for inoculation until the practice  
 “ is become universal amongst all ranks of people. Out of every thousand deaths in  
 “ the Bills of Mortality, the number attributed to the small-pox during the first 30  
 “ years of the eighteenth century, before inoculation could yet have had any effect  
 “ upon them, amounted to 74. During an equal number of years at the end of the  
 “ century, they amounted to 95. So that, as far as we are enabled to judge from  
 “ hence, they would appear to have increased in a proportion of above five to four.”

10,515.  
 Vol. 1.,  
 App., p. 66.

28. We agree with those witnesses who are of opinion that inoculation as practised in  
 this country and many parts of Europe last century did tend to increase the prevalence  
 and mortality from small-pox, that it introduced the disease into places that in all  
 probability would have remained exempt from it, and in some large towns like London  
 it tended to keep the contagion alive and to make the disease endemic. It appears,  
 however, from the Bills that its introduction did not at once or very materially increase  
 the mortality from small-pox in London. This was doubtless owing to the fact that it  
 was scarcely possible to make matters much worse than they were before in  
 regard to the number of small-pox deaths.

282.

29. We are led to believe that but for the disease being kept alive by inoculation, the  
 improvement of the public health which set in towards the end of the 18th century, in  
 obedience to the causes to which we have alluded, would have brought about an earlier  
 and greater decline of small-pox mortality. The mere substitution of a non-  
 contagious process like vaccination for the old inoculation in a population of whom  
 some 80 per cent. or more had acquired naturally or artificially such protection as  
 previous small-pox affords would have a striking effect upon the small-pox death rate  
 by reducing the liability to infection of the remaining susceptible.

30. We think there can be no doubt that, speaking generally, in London last century,  
 whether from the indiscriminate practice of inoculation or from the habitual indifference  
 which permitted small-pox to run riot with little, if any, restriction, the great bulk of  
 persons suffered from small-pox in childhood and acquired such protection as an attack  
 of small-pox affords. The deaths from small-pox each year were chiefly those of young  
 children or newcomers who were exposed to the constant sources of infection always  
 kept going, and to the effects of which they had not been rendered immune. It is clear



that any changes which would have the effect of reducing the chances of infection would diminish for the susceptible the prospects of attack and death by small-pox; while those who had acquired natural or artificial immunity would constitute to that extent a protected class. In so far as vaccination (after the first mistakes of Woodville and Pearson) substituted a non-infectious procedure for the old inoculation, to that extent, and apart from any question of its affording any immunity, it should by checking a fertile cause of the diffusion of small-pox bring about indirectly a reduction of mortality from that disease. Great as such influence must have been, and great as were the efforts which were now for the first time made to restrict the spread of small-pox—by efforts directed against contagion—there were in addition those other influences at work during the last quarter of the 18th century to which we have already alluded, influences which have been continued and intensified during the present century, and which in our opinion must be credited with a considerable share in the reduction of small-pox.

31. Attention has also been directed to the influence of states of peace and war upon small-pox epidemics. Small-pox as well as typhus has not uncommonly been especially prevalent and fatal among armies and nations in a state of war. The privations, crowding, interruptions of regular sanitary organisation associated with sieges and the field of battle are calculated to propagate infectious disease, and such disease under such circumstances is likely to spread far and wide, and regardless of national boundaries to extend to other nations besides those actually engaged in war. The experience of the last century as well as the present indicates a relationship between war and small-pox, and it is not improbable that the fall of small-pox in the earlier part of this century in Europe may have been due in some measure to transition from war to peace, and that certain recrudescences of small-pox during the latter part of the century may have been connected with wars, notably in the case of the Franco-German war of 1870-71.

32. The lull in small-pox which characterised the early years of this century was, then, probably largely due to the cessation of inoculation in a population whose sanitary condition was beginning to improve, as evidenced by the falling death rate from all causes and from fevers, and who had for the most part received naturally or artificially such protection as previous small-pox is capable of affording. In the 80 or 90 years which separated the introduction and abandonment of inoculation there had been enormous improvements in the healthiness of large towns, the influence of which, upon small-pox in particular, had been interfered with and masked by the propagation of this disease artificially.

33. When inoculation of the small-pox became more general in accordance with the method adopted by the Suttons, failure of the operation was in some cases attributed to the patient having previously suffered from cow-pox. Jenner, who was practising at Berkeley in Gloucestershire, became impressed with this belief. He found, however, that some who had undergone the cow-pox, on inoculation with the small-pox, felt its influence just the same as if no disease had been communicated to them by the cow. This experience was shared by the medical men in his district. Jenner then proceeded to draw distinctions between what he called the true cow-pox, and other varieties of "spontaneous eruptions" on the teats, which he classed together as spurious cow-pox. The true cow-pox, *i.e.*, that which was protective, he traced in origin to the heel of a horse suffering from the Grease.

34. Jenner's first writing on the cow-pox was a communication intended for the Royal Society in 1797, the original of which, it would appear, exists in manuscript in the library of the Royal College of Surgeons. The communication was not printed in the Philosophical Transactions, but was returned to Jenner, and, with additions, was published in 1798 as "An inquiry into the causes and effects of the Variolæ Vaccinæ." The original paper asserted that "matter of various kinds when absorbed into the system may produce effects in some degree similar; but what renders the cow-pox virus so extremely singular is, that the person who has been thus affected is for ever after secure from the infection of the small-pox; neither exposure to the variolous effluvia nor the insertion of the matter into the skin producing this malady."

35. Jenner states that the observations which led to the publication of his inquiry extended over 25 years. The original paper for the Royal Society contained an account of only one case of vaccination (*i.e.*, inoculated cow-pox); the other instances cited being three cases of casual infection from the grease of the horse, and 10 cases of casual infection from the cow.

Dealing with the 10 cases of "casual cow-pox" first, it must be premised that inasmuch as the disease conveyed by the cow had in nearly all the cases taken place many



years before they came to Jenner for inoculation with small-pox, it would be impossible to decide what kind of "cow-pox" it was from which they had suffered. Again, it would appear that these 10 cases had been collected from an experience of inoculation extending over some years. One case was inoculated by Jenner in 1778, another in 1791, another in 1792, two in 1795, three in 1797, and in two the date is not given. The effect of the inoculation of small-pox as applied by Jenner in these cases is recorded as local inflammation, often described as an "efflorescence," in some amounting to "erysipelas," but without any constitutional variolous symptoms. In the three cases of casual horse-grease, the date of their infection is not given. Two of these were inoculated with small-pox, in one case six years later, in the other, "some years after," with the result of a slight inflammation only in the first case, and in the second a few eruptions on the forehead which did not advance to maturation. The third horse-grease case on exposure to infection of small-pox caught the disease, the nature of which was verified by successful inoculations in others. Jenner quotes this last case in support of his contention that the virus from the horse could not be relied upon until it had been communicated to the nipple of the cow and thence to the human subject.

36. We will return presently to the only case of vaccination mentioned in Jenner's original paper. The other cases may be thus summed up. In the course of several years' inoculation practice, Jenner collected 10 instances of insusceptibility to small-pox in persons who stated that many years or months previously they had suffered from a disease which they called the cow-pox. He added three cases of grease in the human subject, only one of which gave evidence of insusceptibility to small-pox.

37. Jenner's "Inquiry," published in 1798, reproduced the above cases, and added others. The additions were as follows:—

(1.) A case of casual cow-pox (Sarah Nelmes) from whom lymph was taken for the vaccination of Phipps, the only case of vaccination alluded to in the original paper. She does not appear to have been subjected to the variolous test. (2.) A case of insusceptibility to inoculation in 1792 who was reported to have had cow-pox 10 years previously. (3.) The paupers of Totworth, having been inoculated in 1795 by Henry Jenner, eight who proved insusceptible were reported to have had the cow-pox "at different periods of their lives;" one of them had been attended with the cow-pox in 1782 by Jenner himself. (4.) Three cases of casual horse-grease, in servant men of a farm, two of whom had had small-pox previously; they do not appear to have been submitted to the variolous test. (5.) A child, John Baker, was inoculated with horse-grease from the hand of one of the foregoing. The pustule appears to have shown a disposition to run into an ulcer, and "the boy unfortunately "died of a fever at a parish workhouse" soon after this experiment was made, and before he could be submitted to the variolous test. (6.) Several children and adults were vaccinated directly or indirectly from a cow which had been infected with horse-grease. Three of these were submitted to the variolous test (Summers, Barge, and Pead). The reason why the test was not applied to others is thus stated by Jenner:—"After the many fruitless attempts to give the small-pox to those who had had the "cow-pox, it did not appear necessary, nor was it convenient to me, to inoculate the "whole of those who had been the subjects of these late trials."

38. The original paper and inquiry of Jenner taken together therefore furnish us with four cases in which the human subject had been intentionally cow-poxed, and to whom the "variolous test" had been subsequently applied, viz., Phipps, Summers, Barge, and Pead. The facts in regard to these four cases, as given by Jenner, are summarised in the following table:—

| Name. ●      | Age.    | Date of Vaccination. | Date of Inoculation.                                 | Result.                                                                                                                                                                                                                              |
|--------------|---------|----------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Phipps -  | 8 years | May 14, 1796 -       | 1. July 1, 1796 -<br>2. "Several months afterwards." | "1. The same appearances were observable on the arms as we commonly see when a patient has had variolous matter applied, after having either cow-pox or the small-pox."<br>"2. No sensible effect was produced on the constitution." |
| 2. Summers - | 5 years | Mar. 16, 1798 -      | (No date), but before June 21, 1798.                 | "He was inoculated with variolous matter from a fresh pustule; but, as in the preceding cases, the system did not feel the effects of it in the smallest degree."                                                                    |



| Name.    | Age.      | Date of Vaccination. | Date of Inoculation.                      | Result.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|-----------|----------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3. Pead  | - 8 years | Mar. 28, 1798 -      | } (No date), but before<br>June 21, 1798. | Inoculated by Henry Jenner, who reported :—<br>“I have inoculated Pead and Barge, two of the boys whom you lately infected with the cow-pox. On the second day the incisions were inflamed and there was a pale inflammatory stain around them. On the third day these appearances were still increasing, and their arms itched considerably. On the fourth day the inflammation was evidently subsiding, and on the sixth it was scarcely perceptible. No symptoms of indisposition followed.” |
| 4. Barge | - 7 years | Apr. 19(?) 1798      |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

In these four cases, therefore, subsequent inoculation within a few weeks or months gave results upon which Jenner based the claim that insusceptibility to small-pox was conferred by inoculation of cow-pox.

39. The value of this “variola test,” *i.e.*, the failure of inoculation of small-pox to produce the disease in those who had had the cow-pox, as a test of acquired immunity has been disputed. To assess its value, it is necessary to know what results were likely to occur when the test was similarly applied to those not cow-poxed.

4895, 5008, 4850. 40. It is difficult to arrive at any numerical estimate of the proportion of cases of inoculation, in the modified form in which it was practised at the end of last century, in which little or no eruption of pustules appeared upon the body. There can be no doubt that such cases were more common in the practice of the Suttons and of Dimsdale than in the hands of the earlier inoculators. The cause of the mildness has been variously attributed to drugs, to open-air treatment, to taking the lymph early, to using lymph from the “mother pustule,” &c., but whatever the cause of the mildness, and even when there was only a local pustule, or merely local inflammation, and constitutional symptoms short of any general eruption, the operation was regarded as effective, and the patients were held by some inoculators to have gone through the small-pox, and acquired protection. Adams, in 1805, operating with a mild variety of small-pox, succeeded in carrying on inoculation, in some cases from arm to arm, in such a form that the results on the arm were described as of “legitimate vaccine appearance”; and in half his cases there was no eruption. This and other attempts by Adams, at the Small-pox Hospital in the early years of this century, to perpetuate a favourable small-pox, were interrupted by the prejudices of parents in favour of secondary pustules; although it was urged that “before the discovery of cow-pox, the inoculation of “small-pox was sometimes only followed by a pustule at the arm, with the attendant “fever.” Adams’ experiments of arm-to-arm variolation, giving “vaccine” results, received subsequent corroboration from those of Guillou and Thiele. This mild variety of small-pox had been observed by Jenner, and in 1789 he appears to have used it under the name of swine-pox for the inoculation of his son; and he held that by arm-to-arm inoculation under certain conditions a mild small-pox might be produced at will.

41. The fact that small-pox could be inoculated under certain conditions so as to produce minimum results has an important bearing—

1. Upon the interpretation to be placed upon the “variola test” as applied to vaccinated persons; and
2. Upon the nature of a series of inoculations by Woodville at the Small-pox Hospital with what was called cow-pox, which undoubtedly did much to found the belief that vaccination secured immunity towards small-pox.

42. In regard to the first point, it will be necessary to note, in cases where cow-poxed persons were subjected to inoculation to test their immunity, what was the amount of the local and constitutional results to be expected from the method of inoculation adopted, and how far the actual results differed from those obtained in persons who had not previously had the cow-pox. Whether resistance to the “variola test” implied protection against natural or epidemic small-pox must be reserved for consideration later on. In regard to Jenner’s own cases we find in his “Inquiry,” after alluding to the mild variety of small-pox, which Adams termed “pearl-pox,” he goes on to speak of “the attention that was paid to the state of the variola matter previous

11,144.

11,141.

10,435.

11,150.

Vol. I. App.,  
p. 68, foot-  
note.

25,249.



“ to the experiment of inserting it into the arms of those who had gone through the  
“ the cow-pox. This,” he says, “ I conceive to be of great importance in conducting  
“ these experiments, and were it always properly attended to by those who inoculate  
“ for the small-pox, it might prevent much subsequent mischief and confusion.”

43. In one case in the “ Inquiry ” Jenner does make mention of the source of the variolous matter which he used for his test. In Case 3 (Phillips), he says, “ It was taken from the arm of a boy just before the commencement of the eruptive fever, and instantly inserted.” It was therefore arm-to-arm variolation from an early “ mother-pustule.” In regard to the two cases of vaccination by Jenner set out in the foregoing table, the following statements as to the variolation are made :—In Phipps’s case “ he was inoculated with variolous matter immediately taken from a pustule.” In Summers’s case “ he was inoculated with variolous matter from a fresh pustule.” It is not possible to say, therefore, that in these two cases the method employed differed from that adopted in Case 3 (Phillips).

Now the results obtained in these cases were hardly less than the results obtained in some cases by Dimsdale and other inoculators in persons who had not previously been cow-poxed, but who were nevertheless regarded as having thereby received the infection to an extent sufficient to establish immunity. Vol. iv., App. 1, p. 398.

44. It appears from Jenner’s later publications and correspondence that he sometimes met with more definite results from the insertion of variolous matter in the arms of those who had been cow-poxed than in the cases mentioned in the Inquiry ; in some cases a pustule or vesicle resulted, capable of communicating small-pox, and often attended with extensive inflammation and sometimes by a slight eruption. (Baron, Vol. I., 445, Medico-Chi. Trans., Vol. I.) It is also clear that cow-pox lymph from one of the same stocks used by Jenner (the Stonehouse cow-pox), and in his hands stated to be protective, in the hands of neighbouring surgeons, when submitted to the variolous test, failed to prevent the development of inoculated small-pox in the usual way. Jenner’s Inquiry was read with interest by leading medical men in this country, and for the most part appears to have been favourably received. Haygarth, Percival of Manchester, Ingenhousz (who was on a visit to England), and others asked for more evidence of the alleged protection. Moseley, who led the opposition to the practice, doubted whether the vaccinated would stand proof against epidemic small-pox, and declared the protection to be non-specific and temporary. Dr. Beddoes, of Bristol, who was not unfriendly to Jenner, thus summed up the position of affairs at the beginning of 1799, in a letter to Professor Hüfeland, of Berlin :—“ You know Dr. Jenner’s experiments with the cow-pox. His idea of the origin of the virus appears to be quite indemonstrable, and the facts which I have collected are not favourable to his opinion that the cow-pox gives complete immunity from the natural infection of small-pox. Moreover, the cow-pox matter produces foul ulcers, and in that respect is a worse disease than the mildly inoculated small-pox.” (Hüfeland’s Med. Journal, 1799.) He adds that experiments were to be carried out at the London Small-pox Hospital. 11,780-1. 254. 11,966. 11,975.

45. Thus the matter stood when, in January 1799, cow-pox was discovered in a dairy in the Gray’s Inn Lane, London, and attracted the attention of the leading medical men in town, and became the subject of experiments on a large scale by Drs. Woodville and Pearson at the Small-pox Hospital. 11,182.

Woodville published the results of his experiments in May 1799, and Pearson in March of the same year distributed the hospital lymph to some 200 practitioners at home and abroad. 11,185.

46. This was the starting point of the practice of “ vaccination ; ” for Jenner had lost his strain of lymph. Woodville’s cases merit careful attention, as from their number and detail, and from the fact that he had submitted nearly all of them to the variolous test within three months of their “ vaccination,” and found they resisted it, they produced a profound impression on the mind of the public and the profession. In July 1800, 33 of the most eminent physicians and 40 distinguished surgeons of the metropolis signed a declaration to the effect that “ those persons who have had the cow-pox are perfectly secure from the future infection of the small-pox, and that the inoculated cow-pox is a much milder and safer disease than the inoculated small-pox.” (Morning Herald, July 19th, 1800.)

47. We are unable to find in these early days of vaccination any other evidence on a scale at all comparable to that of Woodville in confirmation of the views advanced by Jenner ; and it is clear that professional authority declared for vaccination mainly upon the experience of Woodville and Pearson.



48. We have received a great deal of evidence on the subject of the nature of the lymph used and distributed so widely at home and abroad by Woodville and Pearson. Its effects differed from those of inoculated cow-pox as described by Jenner, and as observed since, in that in the majority of the cases detailed in Woodville's Reports pustules appeared on the body similar to small-pox pustules; indeed, Woodville spoke of the cow-pox as an eruptive disease, in one case even as confluent, and as sometimes contagious. It is now not disputed that these pustular cases, three-fifths of the whole, were cases of small-pox, and that their resistance to the variolous test accordingly proved nothing as to the alleged protection conferred by cow-pox. How was this source of error introduced, and what was the nature of the remaining two-fifths of the cases?

Some, at any rate, of the "vaccinations" appear to have been performed within the precincts of the small-pox hospital, and it has been suggested that the infection was aërially conveyed.

In several of the first cases (Collingridge, R. Payne, Redding, Pink), small-pox matter was inoculated on the "vaccinated" patient a few days after the cow-pox, and this may have led to contamination.

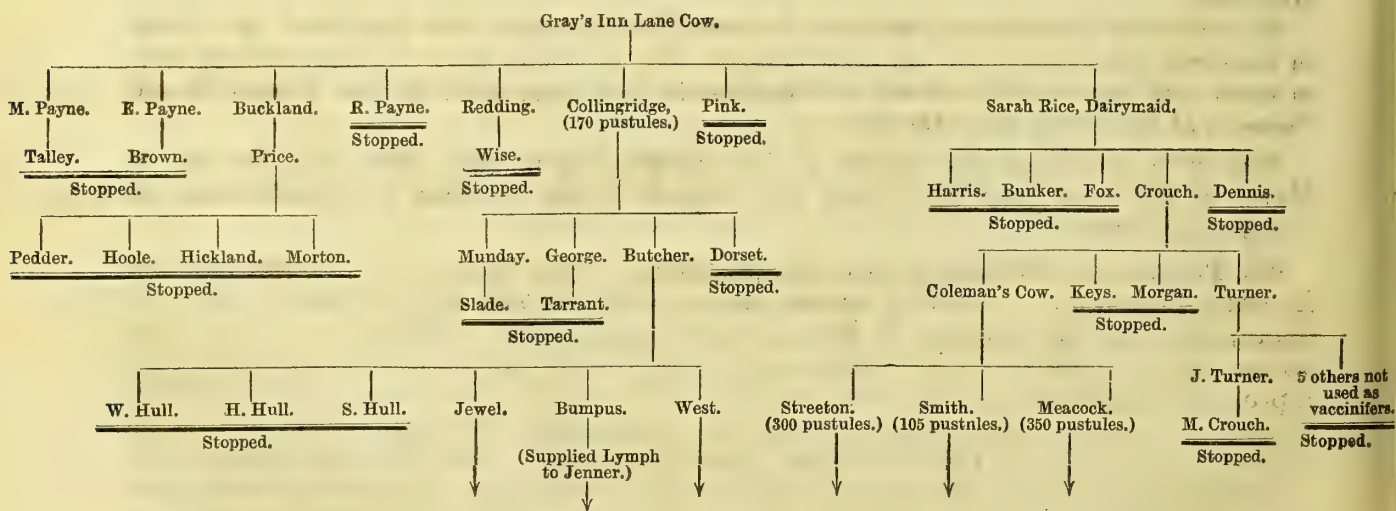
49. But one of the very first cases (Buckland) which Woodville believed he had only inoculated with matter "in a purulent state" direct from the cow exhibited all the symptoms (including a pustular eruption commencing on the inoculated arm), which make it in the highest degree probable that this patient was in fact variolated when he was supposed to have been vaccinated.

50. The three persons (Streeton, Smith, and Meacock) inoculated from a cow (Coleman's) which had been inoculated at one remove from a pustule on the hand of a dairymaid at the Gray's Inn Lane Dairy, similarly at the proper time developed small-pox in a way highly suggestive of its having been inoculated at the place and time of what purported to be vaccination; from these three persons much of the lymph was taken for the subsequent inoculations. The only other case (Collingridge), inoculated direct from the cow, used to any extent for subsequent inoculations, was purposely variolated on the fifth day of her vaccination; it is impossible to establish that the first inoculation in her case was in fact that of cow-pox, and it may well have been, as in the first case mentioned above (Buckland), that what purported to be vaccination was in truth variolation. Her own subsequent symptoms, as well as the results on those inoculated from her arm, support such supposition. Indeed, Woodville's lymph passed exclusively through those suffering from small-pox, for he seems to have avoided carrying on matter from those who exhibited only the local pustule as the result of their inoculation from the Gray's Inn Lane cow, or dairymaid.

Vol. VI.

App. p. 619-623.

PEDIGREE of WOODVILLE'S "HOSPITAL MATTER," showing how the strain continued only through subjects with small-pox pustules.





Indeed, on the assumption that Woodville was dealing with arm-to arm variolation, 4895.  
he only succeeded in obtaining what inoculators before and since claimed to have 25,249.  
obtained when working with undoubted small-pox matter. (Baron, I., 245.) 25,265.

51. It is, therefore, probable that the whole of Woodville's 500 cases which appeared 25,270.  
to confirm Jenner's thesis, and secured the support of professional authority, were in  
fact only a series of mild variolations. It is certain that they were, from first to last,  
contaminated with small-pox. We agree with Professor Crookshank that in either  
case they must be set aside for the purpose of arriving at a decision as to whether 12,089.  
uncontaminated cow-pox confers immunity towards small-pox. Woodville's cases, 11,813.  
therefore, which did so much to establish the practice of vaccination, and which for  
nearly a century have been cited as demonstrating the truth of Jenner's doctrine, must  
be rejected as furnishing false evidence, and valueless as a scientific experiment.

52. The hospital matter of Woodville and Pearson, which produced eruptions of  
pustules and was therefore variolous, was the great source from which in the 11,185.  
years 1799 and 1800, and perhaps later, the practice of "vaccination" was started.  
According to Baron (I. 312), "It is impossible now to deny the fact that this *impure*  
" matter was really disseminated over many parts of England, and also on the continent, 11,764.  
" in place of that of the true *variola vaccinae*." Moreover "the eruptions, which  
" attended many of the early cases of vaccination in London, were unfortunately 11,192-  
" also propagated in different parts of the country, where the *contaminated* matter had 11,204.  
" been distributed by Dr. Pearson" (Baron, I. 339). Moore (History of Vaccination,  
p. 36) says "Variolous matter, under the denomination of vaccine lymph, was spread  
" widely through England, and transported to Germany, and even to the Island of  
" Madeira, where a physician described the vaccine as a pustular disease."

Jenner's original lymph had been lost, and though repeatedly applied to for matter 11,978.  
in the latter part of 1798, he had none to send.

53. On February 15, 1799, Jenner was supplied with Woodville's Hospital matter from 11,847.  
a patient (Bumpus) who had 310 variolous pustules, and in the first case inoculated by 25,276.  
Jenner with this matter pustules appeared on the face, and in the second case, though  
there was no eruption, the local pustule assumed "the variolous character," and the  
areola was studded with minute vesicles. Jenner kept up a stock of this matter from  
arm to arm, and when applied to by Ring for cow-pox matter, Jenner in September  
1799 sent him matter derived from the Woodville stock, explaining that "when I had  
" the pleasure of receiving your letter there was no cow-pox matter here in a fit  
" state to send you" (Baron, I. 358, and Crookshank, II. 184-6). It would therefore  
appear that if at that time Jenner possessed any other strain than the hospital matter,  
such as the Kentish Town lymph alluded to in section 27 of our colleagues' report, it  
was not fit for use.

54. Writing to Moore in 1812 Jenner! accused Pearson of "spreading the small-pox  
" through the land, and calling it the cow-pox" (Baron, II. 383). The medical journals 11,192-  
of the time furnish evidence that the lymph of Woodville and Pearson, when used in 11,204.  
the country, produced variolous eruptions in some instances even proving contagious 25,303.  
as it had done in London. Those thus inoculated also proved refractory to the variolous  
test.

55. It is true, as stated in sections 20, 23, and 27 of the majority report, that Wood-  
ville speaks of having at various times procured lymph from different cows, and with  
it inoculated patients in the hospital ("Observations on the Cow-pox," 1800), but he  
adds, "the effects of all the matter I tried were perfectly similar; and pustules proved  
" to be not less frequently the consequence of these trials than with those made of the  
" matter formerly employed."

56. In the report of the Vaccine-Pock Institution, 1803 (page 4), it is stated that it  
was from two sources *only*, viz., the Gray's Inn Lane lymph taken by Woodville and 25,219.  
Pearson, and the Marylebone lymph taken by Pearson, that the matter used in London  
and the provinces in or about 1799 to the extent of some four or five thousand  
inoculations, was derived.

57. In the letter which Pearson sent on March 12, 1799, enclosing a thread imbued  
with matter, to 200 practitioners, he stated that "in many of the cases eruptions on 11,185.  
" the body appeared, some of which could not be distinguished from the small-pox."

This same "hospital matter" was also widely distributed abroad, to Paris, Berlin,  
Vienna, Geneva, Hanover, and to Portugal and America. 11,190.

58. We read of this matter producing variolous eruptions in distant places as it had  
done at home, and in some cases the variolous test showed a refractoriness had been  
acquired. The hospital matter of Woodville and Pearson would appear to have been the



chief source of the first stocks of lymph used on the Continent and in America. It is true Stromeier of Hanover also received matter from Jenner, but as it produced tedious ulcerations he gave it up in favour of Pearson's stock, which he says "produces frequently an eruption of small pimples." We have been unable to trace the extensive use of any matter sent abroad from this country in these early years which can be clearly shown to have had other origin than the stock of Woodville and Pearson.

59. Fresh stocks of lymph were later on raised by Sacco and others from various sources, such as spontaneous cow-pox, horse-grease, and sheep-pox. Even if we accept Sacco's somewhat sensational accounts of his work we do not find in it corroboration of the thesis of Jenner that cow-pox derived from the grease of the horse is possessed of specific efficacy such as is not possessed by spontaneous cow-pox or the grease as taken from the horse. And as to the matter used by De Carro and sent by him to the East and used so extensively in India, which our colleagues suggest (sect. 27) establishes the use of cow-pox lymph abroad of other than British origin, we learn from de Carro:—"The source of our cow-pox is partly British, and partly originating from the *grease* of a horse at Milan, without any intervention of a cow. The effect was so similar in every respect that they were soon mixed, that is to say, that it was impossible to say, after several generations, and in the hands of innumerable practitioners, what was equine and what was vaccine. The whole British settlements in India have been *equinated*; for the first liquid drop which I sent 25 years ago to India was the second generation of Milanese equine, transplanted at Vienna." (Letter from de Carro to Monro, Edinburgh Journal of Medical Science, Vol. I., 1826, p. 284-5.)

60. Apart from the vague statements of Marshall, which must be received with reserve, we are unable to find in the early days of vaccination any large body of definite evidence sufficient to establish the contention of Jenner, that cow-pox, and especially that of equine origin, affords, when conveyed to man, security from the future infection of small-pox.

61. Whatever may have been the nature of the matter used and so widely distributed by Woodville and Pearson, and even if we must regard it all as derived from small-pox, it seems that after a time, whether from attenuation or dilution of the original matter, or the selection of mild cases, or from other causes, the operation gradually ceased to be followed by pustular eruptions, was no longer infectious, and came to assume the local phenomena now observed in ordinary vaccination.

62. It is clear, therefore, that the bulk of the cases of "vaccination," which in the first few years of the practice were shortly afterwards submitted to the variolous test, and of which record remains, had been inoculated with the hospital lymph of Woodville and Pearson. It would have been satisfactory to find evidence on a similar scale, and recorded with equal detail, of cases inoculated with cow-pox matter pure and simple, and submitted at subsequent periods to the variolous test or epidemic exposure, and showing immunity towards small-pox. Though much research has been directed to this point, it appears to have been almost entirely barren of result.

63. We shall adduce reasons later on for thinking that under the one name of "vaccination" matter derived from various sources, and of diverse origins, has been introduced at different times. It is now no longer possible to trace or distinguish these. We therefore, in using the term "vaccination," must be held to employ it colloquially, and not exclusively as an equivalent for cow-poxing.

64. In the early years of this century it was not unnaturally argued that the renunciation of inoculation was a necessary consequence of the approval of vaccination, and the milder operation was authoritatively urged in substitution of the old practice. In 1808 Jenner contributed a paper to the "Medico-Chirurgical Transactions," in which, after guarding those who thought fit to inoculate after vaccination from unnecessary alarm should a pustule, fever, and a slight eruption ensue therefrom, he concluded thus: "At the commencement of vaccination I deemed this test of security necessary; but I now feel confident that we have one of equal efficacy, and infinitely less hazardous, in the re-insertion of the vaccine lymph." Bryce about the same time advocated the same practice, which was adopted by many, and came to be spoken of as "Bryce's test." (Practical Observations on the inoculation of the cow-pox, 1809.) The significance of this test of re-vaccination we shall discuss later on in connexion with the modern development of that practice.

65. Though in his first essays Jenner merely suggested vaccination as a substitute, in certain cases, for inoculation, there can be no doubt that the claim he originally made for vaccination was one of complete and permanent protection against small-pox. Jenner in his "Inquiry" observed "what renders the cow-pox virus so extremely singular



“ is, that the person who has been thus affected is for ever after secure from the infection of the small-pox.”

66. Cases in which small-pox had occurred after cow-pox had frequently been pressed upon Jenner's attention (Gregory's "Eruptive Fevers," p. 208), and in his third publication in 1801 Jenner thus alludes to these objectors:—"Some there are who suppose the security from small-pox obtained through the cow-pox will be of a temporary nature only. This supposition is refuted, not only by analogy with respect to the habits of diseases of a similar nature, but by incontrovertible facts, which appear in great number against it." He claimed that it had been uniformly found that "the human frame, when once it has felt the influence of the genuine cow-pox in the way that has been described, is never afterwards, at any period of its existence, assailable by the small-pox." In his evidence before a Committee of the House of Commons in 1802 he maintained that "it now becomes too manifest to admit of controversy, that the annihilation of the small-pox, the most dreadful scourge of the human species, must be the final result of this practice." In his petition to the House of Commons he states that he had discovered that "the cow-pox admits of being inoculated on the human frame with the most perfect ease and safety, and is attended with the singularly beneficial effect of rendering through life the persons so inoculated perfectly secure from the infection of the small-pox." (Baron, I. 490.)

1st Report,  
App., p. 94.

67. It was not long, however, before cases of small-pox in those who had been vaccinated began to crop up. Goldson of Portsea published some cases in 1804; Moseley, Birch, and others called attention to failures in London, and in 1809, Brown of Musselburgh published a work containing a number of cases of post-vaccinal small-pox which raised doubts as to the efficacy of the practice and suggested that its powers at best were only temporary. There were also reports from abroad of small-pox subsequent to vaccination, especially in Geneva. (Baron, I. 338.)

25,336.  
25,472.  
11,853.

68. Further failures in London, and particularly one in the family of a nobleman in 1811, excited some opposition to the practice. In 1818 Dr. Monro of Edinburgh published a number of cases observed by himself and others in which small-pox in its perfect form succeeded to vaccination in its perfect form. Small-pox continued to be epidemic in Scotland, attacking many hundreds of the vaccinated in various degrees, and Dr. Thomson wrote a book in 1820 on the varioloid type of the disease. In 1819, nineteen, and in 1825, 147, vaccinated persons were admitted with small-pox into the London Small-Pox Hospital.

69. Other countries of Europe suffered severely from small-pox about this time, and the theory that ascribed to vaccination the reduction of small-pox in the earlier years of the century, in some places to the point of extinction, received a rude shock. In 1828 a severe epidemic broke out at Marseilles, and 2,000 vaccinated persons caught the disease.

Vol. I., App.  
p. 74.

70. In Copenhagen, where the absence of fatal small-pox from 1811 to 1823 had been confidently attributed to the introduction of vaccination, in 1824 there were 41 deaths from small-pox, and in 1835, 434, or 11·2 per cent., of the total deaths. It appears from Dr. Gregory (Lectures on Eruptive Fevers, p. 214) who gives a "Table exhibiting the amount and mortality by small-pox in the well-vaccinated population of Copenhagen, from 1824 to 1835" that of 3,839 persons attacked by small-pox no fewer than 3,093 had been vaccinated. It was these figures that led Dr. Gregory, the physician to the Small-Pox Hospital, in 1843, to declare "that some material error had crept into the views originally entertained regarding the power and capabilities of the vaccine inoculation. If small-pox can invade so large a proportion of a well-vaccinated population, it is obvious, that all idea of banishing that disease from the earth is vain and illusory."

71. The fall in small-pox death rate observed in many places in the first vicennium of this century can hardly be ascribed to vaccination. If the limited and voluntary practice of the operation could be so influential upon small-pox mortality as such a theory demands, it is strange indeed that the more complete and compulsory adoption of it should have been so uninfluential against recurring epidemics as was especially exemplified in the pandemic of 1870-74, and against more recent outbreaks in this country and abroad, in which the vaccinated figured largely among the victims.

App. Vol. I.,  
p. 74.

72. The vaccinated, nowadays, generally constitute the majority of the patients in small-pox hospitals, and in certain limited outbreaks only vaccinated persons have been attacked.

22,433.



Vol. I., App.  
p. 116.

Thus, Mr. Marson records 3,094 cases of post-vaccinal small-pox treated by him at the Highgate Hospital between 1836 and 1851, and a further series of 10,661 such cases between the years 1852 and 1867.

1683.  
1809.  
Shef. Rep.,  
p. 191.

Dr. Gayton during the years 1870 to 1883 treated 8,234 cases of small-pox in vaccinated persons in the hospitals of the Metropolitan Asylums Board. At Sheffield in 1887-8, 5,035 vaccinated persons were attacked by small-pox.

It is, however, superfluous to cite further evidence at this stage to prove, what is no longer denied by anybody, that small-pox attacks the vaccinated.

No witness who has appeared before us has maintained the original contention of Jenner and the earlier vaccinators, and the protection now claimed by those who assert such protection is relative, not absolute; temporary and not permanent.

73. It was at one time alleged that even if vaccination did not invariably prevent attack by small-pox, yet such attack was modified and never severe or fatal. There can, however, be no doubt that fatal small-pox and cases of the disease in all its various types of severity occur in persons who have been successfully vaccinated.

2nd Report,  
App. 3,  
Table A.

74. Dr. Gayton's tables include fatal cases, not only in those stated to be vaccinated but without visible marks, nor only in those whose marks were considered to be imperfect, but also amongst those who exhibited at the time of their attack one, two, three, and four good marks of vaccination. We are not now concerned with the question of relative mortality in the various classes, to which we shall return, but these and numerous other examples suffice to prove, what we believe is no longer disputed by anyone, that severe and fatal small-pox occurs in those who have been successfully vaccinated. As affecting the kind of attack, as well as liability to attack, the influence now claimed for vaccination is a relative one; that is to say, the contention is, that admitting to the full the occurrence of small-pox, and even death from small-pox in the vaccinated, yet the vaccinated are relatively to the unvaccinated in a superior position both as regards the liability to be attacked and the chance of the disease assuming a severe or fatal form.

1st Rep.,  
App., p. 69.

75. Restricting our attention in the first instance to the question of liability to attack, it is right to state that in the earlier part of this century, when cases of the failure of vaccination began to multiply, it was urged that inasmuch as small-pox itself did not invariably prevent a second attack, it was unreasonable to expect that vaccination could accomplish more. This view appeared to receive support when experiments seemed to show that the cow-pox was merely the small-pox of the cow, and it was said the vaccinated are protected against small-pox because they have in fact had it. Indeed, the Select Committee of the House of Commons which inquired into the operation of the Vaccination Act in 1871 reported that they had no doubt "that the almost universal opinion of medical science and authority, is in accordance with Dr. Gull, when he states, that vaccination is as protective against small-pox as small-pox itself."

76. We have already shown that such protection is by no means absolute, but we cannot recall a single witness who has been examined by us on this question who has not admitted that whatever may be the amount of protection afforded by vaccination, it is at any rate less than that conferred by a previous attack of small-pox.

The Registrar-General, in his 43rd Annual Report, thus states the view of "the best authorities" on this point: he says, "it is pretty generally recognised, and this on good grounds, that the immunity derived from vaccination is both less perfect and less permanent than that conferred by small-pox itself; its efficacy diminishing with the lapse of time, while the protective influence of small-pox remains practically unaltered."

654-5.

Dr. Ogle thinks there is no doubt that the protection by previous small-pox is greater than that of vaccination.

Dr. Gayton, after quoting a later opinion of Jenner's to the effect that the protection by vaccination was tantamount to that of an attack of small-pox, says, "Proofs are abundant already, and will continue to accumulate, to disprove these statements."

1801.

Mr. Marson, in the 16 years following 1836, and when he estimated the number of persons who had been inoculated or had small-pox to be probably about equal to the number of those who had been vaccinated, found that only 47 persons were admitted to the hospital suffering from small-pox after the natural or inoculated disease, whereas there were 3,094 cases of small-pox after vaccination.

3770.

Mr. Sweeting is of opinion that vaccination is decidedly less protective than a previous attack of small-pox.

At Sheffield, in the 1887-88 epidemic, Dr. Barry found, as the result of his census, that 18,292 persons, or 6.6 of the enumerated population of the borough of Sheffield,



had had small-pox prior to 1887. Of these, 23 were attacked again in 1887-88, and five died. This gives an attack-rate of 13 per 10,000 against an attack-rate of 155 per 10,000 in the vaccinated.

Sheffield Rep., p. 202 p. 180.

77. The evidence leads us to the conclusion recorded by Dr. Gregory, the physician to the Small-pox Hospital, in 1843, viz., "that any attempt to institute a parallel " between cases of small-pox after vaccination, and cases of secondary or recurrent " small-pox, must fail."

78. The vaccinated, therefore, stand in a position very inferior to that of those who have previously undergone small-pox *quâ* liability to an attack of small-pox. We now proceed to inquire, do the vaccinated stand in a superior position to the unvaccinated?

In other words, is the attack-rate of small-pox amongst the vaccinated less in proportion to their numbers than it is amongst the unvaccinated?

79. Various methods of arriving at an answer to this question have been attempted. A comparison has been made between the ratio of the vaccinated to the unvaccinated of those admitted to hospital with small-pox, and what is estimated to be the ratio of the vaccinated to the unvaccinated in the general population. If vaccination were an absolute protection we should, of course, find only unvaccinated patients in small-pox hospitals. If the protection were, though not absolute, yet relatively great, we should expect to find the proportion of the vaccinated patients relatively small. And in proportion as the ratio of the vaccinated to the unvaccinated in the hospital approximates to that obtaining outside (assuming the admissions to be a fair sample of the whole cases) we must regard the protection against attack of small-pox as approximating to *nil*.

80. No hospital supplies so large an experience, extending over a long series of years, as the London Small-pox Hospital. We learn from the figures recorded by Mr. Marson and Dr. Munk, and the reports of the hospital, that the per-centage of cases of vaccinated small-pox patients to the total admissions has progressively increased with the increase of vaccination among the general population, if not in exact ratio, at any rate in a ratio approximating closely to it.

Munk, R. C. on S. P. Hosps., 4670

| Years.  |   |   | Post-vaccinal Small-pox per Cent. of Total. | Marson, 1871 Rep., 4190.<br><br>9090. |
|---------|---|---|---------------------------------------------|---------------------------------------|
| 1826    | - | - | 38                                          |                                       |
| 1835-45 | - | - | 44                                          |                                       |
| 1845-55 | - | - | 64                                          |                                       |
| 1855-65 | - | - | 78                                          |                                       |
| 1863    | - | - | 83                                          |                                       |
| 1864    | - | - | 84                                          |                                       |
| 1878-79 | - | - | 93                                          |                                       |
| 1885    | - | - | 93                                          |                                       |
| 1888-91 | - | - | (14 cases only) 100                         |                                       |

81. We are not aware of any grounds for thinking that at any time more than 90 per cent. of Londoners have been vaccinated. Judging from the vaccination returns the proportion would seem to be less than this, and the evidence derived from local investigations supports the latter view.

The per-centage of children not finally accounted for as regards vaccination in London is given as follows by the Local Government Board for the years since 1872:—

Rep. for 1894-5, p. 2.

|      |   |   |     |      |   |   |      |
|------|---|---|-----|------|---|---|------|
| 1872 | - | - | 8.8 | 1883 | - | - | 6.5  |
| 1873 | - | - | 8.7 | 1884 | - | - | 6.8  |
| 1874 | - | - | 8.8 | 1885 | - | - | 7.0  |
| 1875 | - | - | 9.3 | 1886 | - | - | 7.8  |
| 1876 | - | - | 6.5 | 1887 | - | - | 9.0  |
| 1877 | - | - | 7.1 | 1888 | - | - | 10.3 |
| 1878 | - | - | 7.1 | 1889 | - | - | 11.6 |
| 1879 | - | - | 7.8 | 1890 | - | - | 13.9 |
| 1880 | - | - | 7.0 | 1891 | - | - | 16.4 |
| 1881 | - | - | 5.7 | 1892 | - | - | 18.4 |
| 1882 | - | - | 6.6 |      |   |   |      |



Similar figures are not obtainable prior to 1872, but there is no doubt that if they could be had they would not show less vaccinal default than do those of later years; and this would be especially true of years prior to the first Compulsory Vaccination Act of 1853.

82. These figures lend no support to the supposition that the number of vaccinated persons\* in London exceeds, if indeed it reaches, 90 per cent. of the whole. We are unable, therefore, to infer from the statistics of the London Small-pox Hospital that vaccination has any very marked effect in reducing the liability to attack by small-pox, seeing that the proportion of vaccinated cases to the total has increased with the increasing proportion of the vaccinated in the population.

83. Another method of arriving at the relative liability to attack in the vaccinated and unvaccinated respectively has been by censuses taken in connexion with epidemics in particular towns. Such censuses have, as in the case of Sheffield, comprised the whole population, or as in the cases of Dewsbury, Leicester, and Warrington, been restricted to particular parts or to the infected houses.

84. The figures derived from these reports have been set out in such detail in sections 176 to 309 of our colleagues' report that it is needless to recapitulate them. We regret that owing to the reports from Dewsbury, Warrington, and Leicester having been made by medical men selected by the Commission, opportunity for examination upon them has been precluded. We shall, therefore, merely draw attention to certain points which we think require to be emphasised.

85. In the case of the Sheffield outbreak Dr. Barry has explained to us the manner in which his vaccination census, was conducted. We are unable to agree that a census conducted after an epidemic has reached its height, and after endeavours have been made to get every one vaccinated who has not already had the disease, is of much value in determining the incidence of small-pox upon the vaccinated and unvaccinated classes respectively. It is true that after Dr. Barry's attention had been called to this source of fallacy he made an attempt to correct the effect of it, and the figures so corrected are given in sections 232 and 234 of our colleagues' report. We doubt whether, even in the corrected figures, anything like a sufficient allowance has been made for the transfer from the unvaccinated to the vaccinated class before the date of the census. This transfer had been so great that in one district, that of Upper Hallam, only one person was found unvaccinated in the invaded houses at the time of the census, and he had had the small-pox during the epidemic. This would give an attack rate of 100 per cent. of the unvaccinated in this particular case. This is, of course, an extreme instance, but it serves to exhibit the fallacy we are dealing with. Not only were persons at ages above those of childhood vaccinated for the first time during the epidemic, but children were vaccinated at an earlier age. Indeed, the rush to be vaccinated, and the pressure brought to bear, tended to inflate the vaccinated population and to reduce the unvaccinated population to zero, or at any rate to restrict it to those of them who had survived an attack of small-pox. The result of a census thus obtained is such as one would naturally expect from assessing the cases of small-pox upon a greatly augmented population in the case of the vaccinated, and a greatly reduced population in the case of the unvaccinated. This criticism would apply even more strongly in the case of censuses of invaded households.

For these and other reasons, we think that censuses thus obtained are of little or no value in determining the incidence of small-pox on the two classes.

86. Another method of arriving at the proportion of the vaccinated to the unvaccinated in the population would be by reference to the vaccination registers. It is, however, only since 1872 that these have been compiled in their present form.

In Sheffield, we learn from Table XCVII. (p. 185 of Dr. Barry's report) that for the years 1878-87, 84 per cent. of the children born during those years were successfully vaccinated, some 10 per cent. died unvaccinated, and 4.5 per cent. remained unaccounted for. But in arriving at a conclusion as to the proportion of the whole population vaccinated on the basis of the vaccination registers, it is necessary to bear in mind that the proportion of the vaccinated amongst those born before the Vaccination Acts of 1853, 1867, and 1871 was in all probability very much less; thus in 1862, at an inspection

\* In Marylebone, one of the better vaccinated parishes of London, an examination of 2,838 children attending various schools in 1894 showed 25.6 per cent. were unvaccinated. (Sanitary Chronicles of Marylebone, August and September 1894.)

29,333-  
29,341.

Sheffield  
R p., p. 161.

29,333.  
2472.  
2376-2432.

Sheffield  
Rep., p. xv.



of the borough school children by an inspector of the Privy Council, 13 or 14 per cent. were found unvaccinated. It would be hazardous to assert, in view of these facts, that the proportion of the vaccinated in the whole population of Sheffield at or about the beginning of the epidemic much exceeded 90 per cent. Now of the cases of small-pox investigated by Dr. Barry in the epidemic of 1887-8, 4,151 out of 4,703, or 88 per cent., were vaccinated.

At Warrington, which like Sheffield had obeyed the vaccination laws perhaps somewhat better than the average of large towns, the per-centage of the births unaccounted for as regards vaccination given for the years 1874-89, in Table VIII. of Dr. Savill's report, varied from 1·7 in 1874 to 8·1 in 1883. Having regard to the facts we have already alluded to in the case of Sheffield, we should doubt whether the proportion of the whole population at Warrington who were vaccinated before the commencement of the epidemic in May 1892 greatly exceeded 90 per cent. Of the 667 cases of small-pox investigated by Dr. Savill, 69 were unvaccinated and 598 were included in the various vaccinated classes, or 89·7 per cent. 2403.  
Warrington  
Rep., p. 25.  
  
p. 28.

In Leicester, which in the beginning of 1893 was described by the medical officer of health as "practically an unvaccinated town," there had been in 1872 to 1875 only 2, 3, or 4 per cent. of the births unaccounted for as regards vaccination, but from 1885 onwards more than half the births were thus unaccounted for, and from 1888 to 1892 the vaccinal default amounted to from 77 to 80 per cent. of the births. Leicester  
Rep., p. 38.

If we assume 50 or 60 per cent. of the population of Leicester to have been vaccinated at the time of the outbreak, it is interesting to observe that of the 357 cases dealt with by Dr. Coupland, 158 were unvaccinated (including 4 "under vaccination"), and 199 (including 1 doubtful vaccination), or 55·7 per cent., were vaccinated. p. 45.

87. Dr. Coupland remarks that "the natural liability to small-pox, unaffected by vaccination, was not so great as has been supposed." He found the attack rate much the same at different ages, despite the great variations in the proportion vaccinated according to his census :— p. 3.

|              |   |   | Vaccinated, per Cent. | Attacked, per Cent. | p. 3. |
|--------------|---|---|-----------------------|---------------------|-------|
|              |   |   |                       |                     |       |
| Under 1 year | - | - | 3·0                   | 21·2                |       |
| 1 to 10      | - | - | 26·0                  | 28·9                |       |
| 10 to 30     | - | - | 84·5                  | 28·1                |       |
| Above 30     | - | - | 97·3                  | 20·5                |       |

88. In Dewsbury for twenty years vaccination has been greatly neglected; from 1873 to 1876 the vaccinal default was from 22·9 to 35·3 per cent. of the births, from 1877 to 1883 the default was less, varying between 12·6 and 19·8, but for the ten years prior to the outbreak, about a third of the children born remained unvaccinated. It would scarcely be safe to assume that of the whole population in 1891 more than two-thirds, or between 60 and 70 per cent., were vaccinated. Of the 1,019 cases of small-pox dealt with by Dr. Coupland 367, or 36 per cent., were unvaccinated (including 21 "under vaccination"), and 652, or 64 per cent., were vaccinated (including 25 alleged to have been vaccinated). Dewsbury  
Rep., p. 10.  
  
p. 113.

89. It would appear therefore that whether as in the case of the London Small-pox Hospital we have regard to the ratio of vaccinated to unvaccinated persons attacked compared with the varying ratio of the vaccinated to unvaccinated in the population at large, or whether we consider the similar ratios in different towns where vaccination has been practised to varying degrees, we find that for the population at all ages the proportion of small-pox attacks on the two classes of vaccinated and unvaccinated respectively approximates closely to the proportion which the two classes bear to each other in the population generally.

90. Whatever influence vaccination may exert against small-pox, then, would appear to lie somewhere between none at all on the one hand, and very considerably less than that of a previous attack of small-pox on the other.

91. We have not received as yet the report of Dr. Coupland from Gloucester, but from the figures contained in section 243 of the report of our colleagues it would appear that from a census made of persons in infected houses 30 per cent. of the vaccinated were attacked, and 46 per cent. of the unvaccinated nearly all of whom were children under ten years of age.



92. The accompanying table serves to show the relative severity in regard to attack rate, mortality, and case-mortality in the various towns from which we have received special reports.

| Place.           | Date.   | Population. | Cases. | Case-incidence per 10,000 living. | Deaths. | Mortality per 10,000 living. | Fatality per cent. of Cases. |
|------------------|---------|-------------|--------|-----------------------------------|---------|------------------------------|------------------------------|
| Sheffield - - -  | 1887-88 | 316,288     | 6,088  | 192·4                             | 589     | 18·6                         | 9·7                          |
| Warrington - - - | 1892-93 | 54,084      | 667    | 123·3                             | 62      | 11·4                         | 9·3                          |
| Dewsbury - - -   | 1891-92 | 162,596     | 1,029  | 63·2                              | 110     | 6·7                          | 10·7                         |
| Leicester - - -  | 1892-93 | 184,547     | 357    | 19·3                              | 21      | 1·1                          | 5·8                          |

The above table shows that Leicester and Dewsbury in which vaccination had been much neglected came off better as regards both attack rate and mortality than did Sheffield and Warrington in which vaccination had been well carried out. And further, while in Leicester, where only 55 per cent. of the cases of small-pox were in vaccinated persons, the fatality was 5·8 per cent.; in Sheffield and Warrington, where more than 80 per cent. of the cases of small-pox were in vaccinated persons, the fatality was 9 per cent. The fact that only 22 or 25 per cent. of the deaths occurred in children under ten is but small compensation to Sheffield and Warrington for their high attack rate and mortality rate.

93. When we proceed to inquire whether vaccination exerts an influence upon the character of an attack of small-pox so as to render it milder or less fatal than it would otherwise have been, our investigation becomes more difficult. If the influence of vaccination on small-pox be only or chiefly that of mitigating the severity of an attack of that disease, rather than the prevention thereof, an important argument for insisting upon the practice on public grounds is neutralised. It is asserted that mild natural small-pox is or may be as infectious as the severer forms, and indeed it is often found that outbreaks of the disease have been traced to infection from unrecognised small-pox in vaccinated persons, the disease being, it is said, so modified in its features by vaccination. If this be so, vaccination may well be a matter for personal choice, as an agency calculated to ameliorate individual cases of the disease, but, if it exert little or no influence against attack by small-pox, it cannot be insisted on as a means of reducing danger to the public by way of infection.

94. Analogy does not here render us much assistance; there is so far as we are aware no evidence to show that in the case of other infectious diseases, attacks of which are held to confer immunity towards subsequent attacks, such second attacks should they occur are milder than the first. Indeed, there is evidence pointing in the opposite direction.

95. Are we then to institute a comparison between the case-mortality or fatality of small-pox last century and the present? Or between times and places where vaccination has been neglected and those wherein it has been well carried out? Or shall we find an answer to the question in the comparison of the fatality in the vaccinated and unvaccinated respectively in recent outbreaks? If we make the last comparison, are we able to sort the two classes accurately, and is vaccination the only material point of distinction between the two classes?

96. We have received a great deal of evidence directed to all these points. Broadly speaking, while there has always been considerable variation in the fatality of the disease at different times and in different places, from about 1 in 3 (33 per cent.) to about 1 in 40 (2·5 per cent.), the fatality on a large number of cases averages about 1 in 7 or 8 (14·3 or 12·5 per cent.). This was the average fatality of natural small-pox generally accepted last century, and used by Bernouilli for his calculations in 1760, as stated in section 53 of our colleagues' report.

Jurin's figures, based upon a large number of cases collected by him during the first half of last century, give a fatality from natural small-pox of 16·5 per cent. of those attacked. We agree with our colleagues that the criticism made upon Jurin's figures, to the effect that deaths under two years of age were excluded, fails to establish the alleged fact.

97. The fatality observed on a total of 60,855 cases of small-pox in the hospitals of the Metropolitan Asylums Board from 1870 to 1894 was 16·7 per cent. This rate includes vaccinated and unvaccinated without distinction. It is important to point out that caution must be observed in comparing the fatality in hospital with cases treated at



home, and also in comparing hospital fatality regard must be had to whether all cases are admitted to hospital or only the more severe. Thus in recent years in London, when the great majority of small-pox cases are at once removed to hospital, the fatality has been as low as 7 or 8 per cent., while in earlier years, when the Asylums Board's hospitals were less generally resorted to and the accommodation limited, the fatality was as high as 20 or 21 per cent.

98. In order to obtain a large aggregate we may add together the London and the provincial figures :—

| —                |   |  | Cases. | Deaths. |
|------------------|---|--|--------|---------|
| London (1870-94) | - |  | 60,855 | 10,183  |
| Sheffield -      | - |  | 6,088  | 589     |
| Dewsbury -       | - |  | 1,029  | 110     |
| Warrington -     | - |  | 667    | 62      |
| Leicester -      | - |  | 357    | 21      |

Here we have a total of 68,996 cases with 10,965 deaths, or a fatality of 15·8 per cent.

99. The broad result is that when large figures are taken the fatality of small-pox now, with a large majority of the cases protected by vaccination, is about the same as it was last century, when none of the cases had received any protective rite.

100. It is true that when the cases of small-pox in various epidemics in this country and abroad have been sorted into groups according to whether the patients have been vaccinated or not, the result is almost invariably to show a higher rate of fatality in the unvaccinated than in the vaccinated class. The range of difference is considerable. Fatalities in the vaccinated from 1 per cent. to 18 per cent., but rarely higher, are recorded. Unvaccinated fatalities of 9, 13, 30, and 50 per cent., and even higher, are recorded. In some sets of figures the unvaccinated fatality rate is three, four, and five times that of the vaccinated; in others, such as the Berlin and Duisburg figures for 1871-72, the rates at various ages are not very different in the two classes.

Table N.,  
App., vol. 2  
pp. 240 and  
236.  
6814.

101. It has been argued that the difference of the case-mortality in the two classes is not due, or not wholly due, to the presence or absence of vaccination, and further that the division into the two classes is not properly made.

Vol. VI.,  
App. 14,  
p. 720.

It is alleged that the unvaccinated differ qualitatively as well as quantitatively from the vaccinated. Thus, this class, it is urged, includes (1) infants under the age of vaccination; (2) those whose vaccination is postponed on account of poor health in obedience to the instruction to public vaccinators to vaccinate only those who are healthy; and (3) those of the lowest and most neglected social class. Inasmuch as these, when they constitute a considerable proportion of the whole unvaccinated class, would, from reasons apart from vaccination, raise the case mortality, it is urged that the high fatality of the unvaccinated must not be ascribed merely to the fact of their non-vaccination.

8713.

Objection has also been made to the classification by marks on the skin of cases of a disease whose chief symptom is, and the chief cause of whose fatality is, the abundance of an eruption on the skin. It is claimed that the fact of vaccination or non-vaccination of small-pox patients should be determined by reference to the vaccination registers, not by the visibility of marks on the arm.

8709.

Reference has been made to some of these objections in our colleagues' report, but we hardly think sufficient weight has been attached to them. It is clear that if these objections are well founded, some part of the difference between the fatality of the vaccinated and the unvaccinated is explicable without reference to vaccination. It is difficult to say whether the whole difference can be thus explained.

102. There can be no doubt that in towns where vaccination has been well carried out a considerable proportion of the unvaccinated population consists of young infants. Thus at Warrington it was found by Dr. Savill that of 57 unvaccinated children living in the invaded houses, 22 were under one year, of these 13 were one month or under, and of these eight were attacked, and all of them died; these eight babies constituted one-third of the total unvaccinated deaths. The inclusion of such cases in the unvaccinated class raises the unvaccinated case mortality, while the vaccinated class is necessarily free from a similar contingent of young infants.

Warrington  
Rep., pp. 35  
39, 49, 54.



103. A certain number of children are every year reported as having had their vaccination postponed by medical certificate on account of ill-health; thus, in the year 1892, 13,278 were so reported in England and Wales. It is possible some of the ailments necessitating postponement may not have been very serious, but this again constitutes a sub-class of the unvaccinated class which has no counterpart among the vaccinated, and may have an influence on the case mortality. It is obvious that the importance of the presence of these two classes of the very young and the postponed among the unvaccinated becomes greater in proportion to the strictness with which the Vaccination Acts are enforced. In towns where the Acts are thoroughly carried out the unvaccinated class should consist almost exclusively of these two sub-classes, in whom it is urged a high fatality rate is to be naturally anticipated. It is certainly curious to note that while the unvaccinated fatality rate is given as 49·6 per cent. at Sheffield and 35·3 per cent. at Warrington, at both of which vaccination has been thoroughly enforced; at Leicester, where the unvaccinated class was much larger and very differently composed, the unvaccinated fatality is recorded as 12·0 per cent. The mere fact of non-vaccination is evidently insufficient to explain this remarkable difference.

1842-3.

104. Dr. Gayton thinks the unvaccinated patients he treated were drawn from a poorer class than the vaccinated, and that this circumstance would tend to make the fatality among them higher than in the vaccinated. It would appear that, except in towns where the Acts are not administered, a not inconsiderable proportion of the unvaccinated is contributed by waifs and strays and paupers. Dr. Stevens, in giving evidence before the Hospitals Commission of 1882 (Q. 3434), thus explained the prevalence of small-pox in London. He said there were three very distinct classes of people who helped to keep up small-pox in London. "First of all from a very large class, viz., "immigrants; and those immigrants I calculate to the extent of two-thirds, are "workhouse-born people. I estimate, of course very roughly, there are about 10,000 "children born every year in workhouses and lying-in institutions, and hitherto they "have universally escaped vaccination, because once out of the workhouse unvaccinated "it is impossible to get at them, no one knows of them, and having lost their birth "record they wander about, and to a large extent get up to London and get small- "pox. Then just imagine the numbers of years that these unvaccinated workhouse "children have been accumulating." That among such persons, apart from vaccination, a high fatality rate should obtain is at least probable. We know that Dr. Murchison, from the figures he collected at the London Fever Hospital, found that social class as well as age had an influence on the case-mortality of typhus fever. He found:—

|                                  |   |   |   |                 |
|----------------------------------|---|---|---|-----------------|
| In paying patients a fatality of | - | - | - | 14·89 per cent. |
| „ free non-pauper                | „ | „ | - | 18·58 „         |
| „ parish paupers                 | „ | „ | - | 27·64 „         |

The influence of social class upon case mortality of infectious diseases is also brought out by comparing the statistics of the London Fever Hospital, which now only admits paying or non-pauper patients, with those of the Metropolitan Asylums Board hospitals, which admit pauper and non-paying patients.

CASE-MORTALITY IN 1889 FROM

Hopwood,  
Lords' Com.  
1891,  
21,675-  
21,682.  
Ann. Rep.,  
M.A.B.,  
p. 18.

| —                                    | Scarlet Fever. | Typhoid. | Diphtheria. |
|--------------------------------------|----------------|----------|-------------|
| London Fever Hospital                | 1·2            | 5·2      | 17·6        |
| Metropolitan Asylums Board hospitals | 8·85           | 15·15    | 40·74       |

We think it probable that social class has an influence upon small-pox fatality in the same direction.

30,826-37.

105. Three main varieties of small-pox are recognised—the discrete, the confluent, and the malignant. The first is rarely fatal even in the unvaccinated; the last is almost always fatal even in the vaccinated. It is the confluent variety that mainly dominates the case mortality of the whole. Now it is in the confluent variety that question is most likely to arise as to whether marks of vaccination are present or not. If seen early, before the eruption is complete, no difficulty may be encountered, but in cases not seen until a later stage, in which the eruption is abundant and the liability to a fatal issue great, difficulty has undoubtedly occurred. It is in these worst cases that in the opinion of Dr. Birdwood, there is risk of including vaccinated cases in the

1816-20.

30,832-47.



unvaccinated category. Indeed, so alive to the difficulty of classification by marks is Dr. Birdwood, that, after an experience of 12,000 cases of small-pox, he is of opinion that "the evidence of primary vaccination collected in small-pox hospitals should not be relied on. Because—

- "(1.) On the outbreak of an epidemic there is necessarily much administrative confusion, and many untrained observers. The early observations are incomplete and faulty.
- "(2.) In the worst instances the eruption may be sufficient to, and does, obscure the scars.
- "(3.) The statement of parents as to primary vaccination, and of adult patients as to re-vaccination, should be accepted even when scars are not seen.
- "(4.) Scars produced in infancy grow with the growth of the body, as was pointed out, I understand, by Sir James Paget.
- "(5.) In such statistics insufficient allowance is made for other circumstances, such as occupation, intemperance, and the existence of other diseases. An altogether different death-rate might be anticipated if small-pox broke out in a public school, or in the infirm and aged wards of a workhouse. A typhoid fever patient, or an ill-fed baby, catching discrete small-pox and dying, would be counted a death from small-pox, obviously neither vaccination nor its neglect having anything to do with it.
- "(6.) The accurate observation and record of clinical details is one of the most difficult duties required of medical men employed in hospitals for infectious disease."

106. We could have wished, in view of the doubt cast upon the classification of small-pox patients into vaccinated and unvaccinated, that resort had been oftener had to the vaccination registers for corroboration or correction.

We note that Dr. Savill was alive to the difficulties to which we have alluded; in his report on the Warrington outbreak, he says:—"In nearly all fatal cases the eruption is profuse and tends to hide the vaccination scars if they exist. Hence the doctor's or nurse's evidence 'unvaccinated' if based solely on their own observation is less valuable than the doctor's statement 'vaccinated.' Such was probably the source of error which arose in Case 473. If the pocks are very plentiful, or are situated over the vaccination scars, or when the congestion and induration of the skin, so characteristic of severe small-pox, is present in large amount, then the plainest of scars, and certainly a faint one, is liable to be described as absent."

He also cites an instance in which reference to the vaccination register sufficed to rectify an important error:—"Cases 79 and 75. The brothers Peter and James L——, æt. 20 and 8 respectively, are very good illustrations of the difficulties which often beset an inquiry as to vaccination in fatal cases. For a long while I was assured on good authority that they were both unvaccinated persons. I was told that no record could be traced of their vaccination, and no marks could be seen during life. The death certificate, of which I procured a copy, contained the word 'unvaccinated' in both cases. Both mother and father of these lads were dead, and those members of the family available could give me no definite information. I therefore included them, at first, in the unvaccinated class. But some time later I succeeded in finding an older brother, who stated in general terms that he was sure all his brothers and sisters had been vaccinated except little Walter, another child who contracted the disease and recovered (Case 80). This statement was confirmed by his uncle Sam and an old friend of his mother's. Next I sought an old friend and servant of the family, who said 'she always thought Peter was vaccinated; but as to Jimmy I used to see his marks thro' washin' 'im so often; he had two good 'uns.' Finally, I determined to search the vaccination register myself and found that against the name of Peter L——, who was born on May 26th, 1872, the vaccination entries were vacant, but against the name of James L——, who was born on April 12, 1884, was an entry of successful vaccination on August 22nd, 1884."

107. Dr. Savill also calls attention to the fact that vaccination scars tend to become obliterated with age, and to alter in character with time.

108. In earlier statistics, and in many of Dr. Luff's tables in regard to small-pox in London, only two classes appear, viz., those vaccinated and those unvaccinated, apparently no evidence as to vaccination being accepted except the presence or absence of scars on the arms. Dr. Ricketts, of the Small-pox Hospital Ships, calls especial attention to this class in his report for the year 1893, showing that "an absolute reliance ought not to be placed on this evidence. There is no doubt that cases occur



- p. 136. " in which vaccination has been successfully performed, although cicatrices are not present when the attack of small-pox supervenes. There is a small class, too, but naturally a very fatal class, in which the rash is too abundant over the upper part of the arm for an assertion to be made that scars are absent." Dr. Ricketts truly observes that "in considering the vaccination statistics of small-pox cases, it is clear
- p. 138. " that in comparing the vaccinated with the unvaccinated class, it would never do to leave out of consideration these doubtful cases among which the fatality is so high, a class which includes nearly a quarter of the total deaths."

p. 136. 109. Attempts have been made to classify cases of small-pox according to their severity as well as according to their fatality. This classification is open to the obvious objection that "no two men could, independently, classify the same series of cases in the same way." When a further division of the severe and mild cases into vaccinated and unvaccinated is made, another source of error is introduced by reason of the inconclusiveness of the evidence as to vaccination.

110. When we consider all the sources of error to which we have alluded we are led to conclude that the difference in fatality between the vaccinated and unvaccinated small-pox patients is not as great as is sometimes contended, and that so far as it exists it cannot be due merely to the effect of vaccination, while the fact that the fatality of all cases lumped together is practically the same now as it was in the unvaccinated of last century, when large numbers are taken for comparison, strongly suggests that the inclusion of a large contingent of vaccinated persons has not exerted a mitigating effect on the average fatality of the whole.

111. In view of the fact now recognised, that whatever protection vaccination affords against small-pox is temporary and relative, not permanent and absolute, various attempts have been made to determine what is the shortest period within which an attack of small-pox can occur after vaccination. We have shown that the variolous test, or the inoculation of the vaccinated, was largely given up after the first few years of this century, Jenner and Bryce advocating the re-insertion of vaccine lymph as a test of equal efficacy. The records of attempts at producing small-pox by inoculation at various periods after vaccination are, therefore, not very numerous. We shall allude to some of those which have been laid before us. Evidence is also available on the point in question as the result of inquiries which have been made as to the date of vaccination and the onset of subsequent small-pox in various epidemics. Lastly, we have the results of re-vaccination at different intervals of time from primary vaccination.

- 95,472-8. 112. Goldson, of Portsea, in 1804 published cases of the inoculated and the natural disease occurring within two or three years of vaccination. In 1809 Brown, of Musselburgh, published his "Inquiry into the Anti-variolous Power of Vaccination," in which
- 11,852. he recorded 48 cases of children who had caught small-pox within three, four, five, six, seven, eight, nine, and ten years of their vaccination. He relates also how he had abandoned inoculation since the year 1800, having been satisfied with the negative results he obtained in those whom he had tested a few weeks or months after their vaccination. The occurrence of small-pox in vaccinated children led Brown to apply the variolous test to some vaccinated children at a longer interval of time; he then found that after the lapse of from three to six years vaccination no longer rendered the variolous test ineffectual, and he was forced to the conviction "that vaccination even in the most
- 11,855. " perfect form is not only incapable of imparting permanent security against small-
- 25,479. " pox, but even of retaining the system in that state of impregnation capable of only
- 25,517-21. " allowing it to exercise its influence to a safe or trifling extent." It is a matter of regret that the writings of Brown and Goldson were not received with the attention and courtesy from their contemporaries that they deserved. Had they been then fairly considered much misapprehension and misrepresentation might have been avoided.

113. A relatively low fatality rate in vaccinated children under ten is, as is shown in the report, a remarkable feature in recent epidemics, and this, if it were constant, might well be urged as a ground for encouraging the practice of infant vaccination when small-pox is prevalent, if no other means for controlling the disease were available. This, however, is not the case, and we believe that, if the measures of prompt detection and isolation we advise were universally and energetically adopted, there would be no excuse for allowing small-pox to run riot or to invade the settled population, and least of all to attack young children.

- Sheffield Rep., p. 178. 114. We find that at Sheffield in 1887-8 there were according to the census 353 cases of small-pox in vaccinated children under ten years of age, of whom 121 were under
- 29,381-2. five, of whom 11 were under one. In children vaccinated by public vaccinators
- 29,388. we find cases of severe small-pox at six years, three years, two years, and under one



year; the first two were fatal. There is a case of very slight small-pox at six months and one 14 days after vaccination. 29,391-2.  
29,415.  
29,409.

It is usual to exclude cases at a less interval than a fortnight after vaccination from the vaccinated category, on the ground that the vaccination had not at that period exercised its influence on the constitution, although the "success" of vaccination is registered on the eighth day after the operation; there are plenty of instances. in this and other outbreaks, of the two diseases running their courses together in the same person. 29,411.  
19,814-5.  
28,708.

At Dewsbury in 1891-2 there were 44 case of small-pox in vaccinated children under ten years of age, of whom 17 were under five. Dewsbury  
Rep., p. 114.

At Warrington in 1892-3 there were 33 cases of small-pox in vaccinated children under 10 years of age, of which two were confluent attacks and terminated fatally. Warrington  
Rep., pp. 51  
and 54.

In London in 1892-3 there were 110 cases of small-pox in vaccinated children under ten, 27 of which were under five, and of these seven were under one. London  
Rep., pp. 6  
and 16.

Dr. Browning, medical officer of health for Rotherhithe, writing in 1892, called attention to the fact that children and adults recently vaccinated with humanised lymph, and some showing good marks, worthy of an extra grant from the Government inspector, yet took small-pox within a few days, months, or years of their vaccination. He cited 25 cases of small-pox in vaccinated children under ten of whom three died. 8429.  
12,386(note).

Dr. Gayton in London between 1870 and 1884 saw 1,306 case of small-pox in children under 10 stated to have been vaccinated, of these 137 died, 303 of these cases were between the ages of two and five with 56 deaths, 58 were under two with 12 deaths. Vol. 1.,  
App., p. 245.

Dr. Gayton accordingly thinks that "primary vaccination is a very fleeting "protection indeed," and that it is not absolutely protective up to any age whatever. 1755.  
1768.

115. It has been argued that, inasmuch as cow-pox is to be regarded as the small-pox of the cow, and as vaccination is to place the vaccinated in the same position as if they had been through an attack of small-pox, the repetition of the operation is to be held to be the equivalent of the old variolous test. That consequently as long as re-vaccination is successful, it indicates that the person so successfully re-vaccinated had re-acquired susceptibility to small-pox. If this view be correct it would be strange indeed that, while vaccination was unable to protect an individual against the repeated operation of its own poison, it was yet capable of protecting against the operation of the more potent poison of small-pox. 173.  
177.  
1837-9.

116. The difficulty of this position was early realised by Dr. Pearson and the directors of the Vaccine Pock Institution; in their report for the year 1803 (p. 49) they declared that persons who had undergone vaccination could not undergo it a second time, and that persons who had undergone small-pox could not be infected with the cow-pox. These views are strangely out of harmony with the experience and practice of to-day.

117. If we accept, with Jenner and Bryce, the theory that re-vaccination is a test of susceptibility to small-pox "of equal efficacy" with variolous inoculation, we then have a means whereby we may gauge the duration of the temporary protection or antagonism conferred by vaccination.

118. The earliest experience of re-vaccination on an extensive scale is recorded by Heim in the Wirtemberg army in 1829. Out of more than 14,000 soldiers who were re-vaccinated about 60 per cent. exhibited perfect or modified success. Another series gave a perfect success in more than 50 per cent. of the re-vaccinations. Moreover, a perfect result was obtained not less frequently in those who presented normal cicatrices than in those in whom the scars of primary vaccination were defective; and again there was no marked difference in the success of vaccination on those soldiers who bore marks of small-pox from that which attended the re-vaccination of those who did not. Vol. I., App.,  
p. 47.

119. The experience derived in recent years from our own army is similar. The table put in by Brigade-Surgeon Nash shows that in nearly half of the re-vaccinations of soldiers and recruits perfect vaccinal pustules are obtained; in about a fourth of the whole a modified success occurs; while in the remainder the operation gives a negative result. Vol. II., App.  
8, p. 277.

Higher per-centages of success are recorded by continental observers, 70, 80, and even 90 per cent. being mentioned in the case of military re-vaccinations. In the case of school children in Germany at the age of 13 or 14 the success rate is 70 to 82 per cent. 11,606.

120. M. Layet, of Bordeaux, has recorded the results of a large number of re-vaccinations of school children at different ages, with calf lymph. Putting aside the partial or modified results, described by him as *fausse vaccine*, he found that in 41 to 45 per cent. of the whole number at all ages he obtained perfect vaccine vesicles. 11,607-  
11,649.  
11,619.  
11,626.

Moreover, his success-rate was about the same in children of six years old as it was in those over 13. The exclusion of the modified successes or "*fausse vaccine*" from Layet's figures makes his success-rate appear lower than that of other observers, who Vol. IV.,  
App. 1,  
p. 407-8.



included all degrees of success. The striking feature about Layet's figures is that vaccinated children of six show as great a susceptibility, or, as it is argued, as much unprotectedness against small-pox, as do those of 13.

121. Similar experience is afforded by the results of re-vaccination of the children of soldiers in this country. The success-rate is greater and the failures fewer in the case of the re-vaccination of children than in that of soldiers or recruits. Inasmuch as the latter are further removed from their primary vaccination, want of success of re-vaccination can hardly be ascribed to the abiding influence of the first operation. Indeed the fact that the success-rate in the re-vaccination of children approximates nearly to that of their primary vaccinations, while the *primary* vaccination of recruits and soldiers is less successful than that of children, strongly suggests that the failure or modified success of re-vaccination in adults is due not to the abiding influence of a primary vaccination, but to other changes the result of age.

122. The results of vaccinations and re-vaccinations in the army formed the subject of an interesting paper by Professor F. Smith, of the Army Veterinary School, communicated to the Sanitary Institute in 1892, and entitled "For how long does vaccination confer immunity against small-pox?" He noted that the per-centage of successful vaccinations was 92·64 per cent., of successful re-vaccinations 88·37 per cent. Of the 79,591 re-vaccinations, 15,842 had a modified success, and 54,497 had perfect vesicles. In the latter "the vesicles are as perfectly defined as in a primary vaccination. It is important to bear this fact in mind, for no matter what view we take of the modified vesicle, I think there can be no doubt that a person who develops a perfect vesicle is one who would have contracted small-pox if exposed to the contagion. On examining the 5,832 primary vaccinations it is found that 92·64 per cent. were successful; these vaccinations were only  $4\frac{1}{4}$  per cent. better than the re-vaccinations. In what way are we to interpret these results? It is certain that of 79,591 persons only 11·63 per cent. (adopting vaccination as a test) were protected against small-pox, and this number may be further reduced when we consider that many of the failures were due to other causes than protection, for of the primary vaccinations 7·36 per cent. failed. If, therefore, we take these figures as representing the failures due to inert lymph, &c., it leaves only 4·27 per cent. of the adults as protected against small-pox by their previous vaccinations."

Professor Smith further states that within three years of a thorough re-vaccination it is possible for a person to be successfully re-vaccinated, the result produced being naturally of a modified character. He adds: "I can, however, go a step further than this, and affirm that, after a successful primary vaccination, it is possible to successfully re-vaccinate a person 12 months later, the only difference between the first and second vaccinations being that the latter will run a more rapid course, though, excepting for this fact, the character of the vesicle produced is nearly indistinguishable from a primary inoculation."

123. If vaccine is to be regarded as attenuated variola, we are not aware of any ground for anticipating that after immunity towards the weaker virus has ceased, immunity towards the stronger virus should continue.

124. That even severe small-pox does not prevent the success of subsequent vaccination is shown by the experience of Dr. Scroggie, of Aberdeen, quoted by Mr. Skelton:—

"Although a second attack of small-pox is very uncommon, I re-vaccinated 15 cases who had had the disease, some of them severely, as indicated by the deep and numerous pittings left, and in 13 found them susceptible to the vaccine virus. The disease is usually fatal at the extremes of life, so I have vaccinated from the infant of a few weeks to the adults from 80 to 90 years of age. The re-vaccinations done were 356 in number, and of these 339 were successful."

125. It would appear from the foregoing facts that while shortly after vaccination there may be a certain amount of immunity or antagonism to the influence of renewed vaccination, or inoculation with small-pox, and therefore, it may be argued, to the natural disease, this soon wears off, perhaps more rapidly in some than in others. It would seem that in the majority of cases susceptibility to re-vaccination is encountered in a few years, though tests at shorter intervals do not appear to have been extensively made. The evidence suggests that insusceptibility towards inoculation is not more lasting; while cases of natural small-pox are recorded at all possible intervals subsequent to vaccination.

126. Attention is called in section 293 of our colleagues' report to the results of some 20,000 cases of small-pox when classified according to the number of marks they exhibited. It must be borne in mind that these cases must be regarded as 20,000 failures of the protective properties of vaccination as originally proclaimed, and that it would not be very remarkable if, speaking generally, it were to be found that in classifying cases of a disease whose fatality is mainly due to the amount of eruption,



those cases would on the whole show a higher recovery rate in whom a greater number of scars could be clearly discerned on the skin of the arm.

127. In regard to the manner and degree in which the number and quality of the vaccination cicatrices exert an influence over the liability to or the severity of subsequent small-pox, we have received a good deal of conflicting evidence. It has been argued that if the virus of the vaccine disease be of a self-multiplying character, one insertion should, as was originally held, be as efficacious as many; and that the nature of the cicatrix being due largely to local causes, or individual peculiarities, this can indicate nothing as to the constitutional effect which the virus has produced. On the other hand, a large collection of statistics, such as those of Marson and others, has been adduced to prove that the mitigating effect of vaccination varies with the number of cicatrices, and that the area and foveation of the scars affect the fatality of subsequent small-pox.

128. There are some points in regard to the late Mr. Marson's statistics which it would have been well to have elucidated further, but it has not appeared possible to do so. We refer especially to his method of deducting deaths due to superadded disease, and to his mode of dealing with cases in which abundance of the eruption obscured the cicatrices, cases which occasioned considerable difficulty in classification to his predecessor, Dr. Gregory, and to many later observers. There is a good deal of evidence, especially from France, showing that neither the number nor the quality of primary cicatrices exerts any influence upon the success of re-vaccination; indeed, it is noted by some observers that re-vaccination is more likely to take in those in whom the scars of primary vaccination are large and well-marked. Moreover, it would appear that in the practice of the most experienced vaccinators, and with the same lymph of the best quality, the cicatrices vary immensely; some are plain, some puckered, some foveated, indeed, one French observer has figured some 70 varieties of scar resulting from vaccination. This would tend to show that differences of constitution, age, the mode of performing the operation, the extent of the local inflammation, &c., have an important bearing on the qualities of the resulting scars.

129. We are also struck with the different methods adopted by different observers in classifying cases of small-pox according to the vaccination marks. Thus Dr. Gayton, who collected 10,403 cases, informed us that when he found one good mark and three imperfect marks, he might class them as a case of two good marks, or he would ignore the three imperfect marks and class the case as one of a single good mark.

Dr. Gayton, among his 10,403 cases of small-pox admitted to hospitals of the Metropolitan Asylums Board between the years 1870 and 1884, found 2,085, or 20 per cent. of the whole number, to be what he calls "vaccinated with good marks," while Mr. Sweeting, at another of the Board's hospitals in the years 1880-85, out of 2,584 cases only placed 39, or 1.5 per cent., in the category of "good vaccination." It is evident that such a difference indicates a wide margin for personal discrimination as to what is and what is not "good vaccination."

At Dewsbury, Dr. Coupland reports that while small-pox proved fatal in ten cases out of 175 with two marks, no death occurred among the 34 cases with only one mark; and again, while one death occurred among the 42 persons with four or more marks, all the 210 with three marks recovered.

Dr. Luff's figures for London show a higher fatality among those with two marks than in those with one mark; in the former it was 3.4 per cent., and in the latter 2.7 per cent. In Marson's figures the one mark cases were accorded a fatality of 13.8 per cent. in 1852-67.

Dr. Savill does not classify the Warrington cases according to marks, but he gives cases and illustrations to show that small-pox is sometimes more severe in those members of a family who present first class or typically perfect scars than in those who show indifferent evidence of vaccination. Such cases, he was subsequently led to think, were exceptional.

Mr. Sweeting's figures seem to show that age has an important bearing upon any influence the number of the vaccination marks may exert. Thus over 30 years of age he found that the fatality was—

|              |                                              |
|--------------|----------------------------------------------|
| With 1 mark, | 124 cases with 19 deaths, or 15.32 per cent. |
| „ 2 marks,   | 149 „ 20 „ 13.42 „                           |
| „ 3 „        | 105 „ 16 „ 15.23 „                           |
| „ 4 „        | 50 „ 7 „ 14.00 „                             |
| „ 5 or more  | 27 „ 4 „ 14.81 „                             |

So that it would appear that after 30 years of age the number of the scars is a matter of indifference as regards fatality of small-pox.

130. We cannot, in view of the diversity of classification adopted, and the abundant sources of error to which such basis of division is inherently liable, attach any great



importance to statistics dealing with the number of the cicatrices. As to quality, it seems that the character of scars is largely dependent on conditions other than the nature of the lymph employed, and any relationship between quality of scar and succeeding small-pox may be the result of such conditions and not of the influence of the lymph inoculated.

25,743.

131. There has been a change in the age-incidence of fatal small-pox ; small-pox has been less a disease of childhood than it used to be. Statistics collected last century, and especially during the inoculation period, when small-pox was almost endemic, seem to show that a large proportion of all children suffered from it, and the deaths from the disease were mostly those of children. Records of the 17th century suggest that the disease at that time was less prevalent and affected adults as well as children. It has been pointed out that " the whole question of the age incidence of fatal small-pox depends on the frequency of the epidemics. If an epidemic comes once in 20 years you will not have the same proportion of deaths under five years as you have in a place where it comes in a period of less than five years. It all depends upon that ; and there is no possibility of getting any general law from isolated places."

24,802.

132. While it seems to be true that last century in towns and places where, through absence of any precaution against spread, or by promiscuous inoculation, small-pox was kept endemic, the bulk of the small-pox deaths were of persons under ten years of age, this does not appear to have been uniformly the case in the country or in places where the disease was only introduced at long intervals.

133. Thus in a most careful account of an outbreak of small-pox in the little parish of Aynho, in Northamptonshire, in 1723-4, preserved in the Royal Society's Library, it is stated that of 132 cases of the disease only 28 were under ten, and of the 25 deaths only four, or 16 per cent., were under ten. In many records from different towns the large proportion of the total deaths from small-pox which occurred in children is brought out, some 80 per cent. of the whole being under five.

1st Report,  
App., p. 76.

134. During the present century, and especially since 1870, the larger incidence of fatal small-pox on adults has attracted attention. There have been considerable differences in different places and in different epidemics. Thus in Paris in 1842-51 it was observed that 66 per cent. of the total small-pox deaths occurred in persons above the age of 5, while in London at about the same time only 32 per cent. of the whole were above that age. It is obvious that various causes, *e.g.*, the ages of the exposed population and other local considerations, must be borne in mind in arriving at any conclusion as to the cause of the observed phenomena. Thus, small-pox if it spread in a school would necessarily fall upon a different age class from what it would if it spread in a factory or barracks.

135. In sections 171-192 the change of age-incidence has been fully treated in special relation to changes in the law and in regard to vaccination ; in this relation it is therefore unnecessary to labour the point further.

136. It is important to bear in mind that the change we are discussing is not merely a change of distribution of a fairly constant or diminishing number of small-pox deaths as between infants and adults, but that there has actually been in proportion to the population at each age during certain years an increasing death-rate of adults from small-pox, notwithstanding the increasing use of vaccination and re-vaccination.

137. Thus in the table contained in the 43rd Report of the Registrar-General for England it is shown that if a comparison be instituted between the small-pox death-rate at different ages during the period 1872-80 (when vaccination was as efficiently enforced as it ever has been) with the period 1847-53 (when the practice was voluntary) we find that at every age over 10 years the chance of dying of small-pox was greater in the period of compulsory vaccination.

MEAN ANNUAL DEATHS IN ENGLAND AND WALES AT DIFFERENT AGES PER MILLION LIVING  
AT EACH SUCH LIFE PERIOD.

|                                    | 0-    | 5-  | 10- | 15- | 25- | 45 and<br>upwards. |
|------------------------------------|-------|-----|-----|-----|-----|--------------------|
| 1847-53.<br>Voluntary vaccination  | 1,617 | 337 | 94  | 109 | 66  | 22                 |
| 1872-80.<br>Compulsory vaccination | 323   | 186 | 98  | 173 | 141 | 58                 |



These figures are so serious that they have been urged by Dr. Bridges as sufficient 30,871.  
ground for a revision of the law ; he thinks that if these facts had been generally  
known at the time the Legislature would have hesitated as to the compulsory law.

138. The London figures are not less remarkable :—

| ANNUAL SMALL-POX DEATH RATES PER 100,000 AT DIFFERENT AGES IN LONDON. |   |            |                         | Thorne,<br>1st Report,<br>p. 118. |
|-----------------------------------------------------------------------|---|------------|-------------------------|-----------------------------------|
|                                                                       | — | 0-5 Years. | 5 Years and<br>upwards. |                                   |
| 1851-60 -                                                             | - | 130        | 13                      |                                   |
| 1861-70 -                                                             | - | 116        | 14                      |                                   |
| 1871-80 -                                                             | - | 113        | 34                      |                                   |
| 1881-88 -                                                             | - | 37         | 15                      |                                   |

Thus we see that, except in the last period (which has been one of increasing default  
in regard to vaccination), and then only in the case of those under five years of age,  
there has been no substantial reduction of small-pox mortality, while at all ages over  
five the mortality from small-pox has been actually greater in the last three periods  
than in the first. Such saving of life as there has been in London in the period  
1851-88 was most noticeable in the period 1881-88, and was confined to children  
under five years of age.

139. It has been urged that the observed changes in age incidence of small-pox mor-  
tality point to vaccination rather than sanitary reforms as the cause of the difference,  
since sanitary reforms should operate equally upon all ages, while vaccination might be  
expected to affect especially the young. There are, however, some considerations  
which prevent the acceptance of this explanation, at any rate for the whole of the  
facts. The increased death-rate from small-pox in persons above the age of child-  
hood might with equal reason be ascribed to vaccination, or at least seems incompatible  
with the belief that the influence of vaccination against fatal small-pox is of an  
abiding character. Moreover, it has been pointed out by the Registrar-General in 363.  
his report for the year 1879 that sanitation operates differently upon the general  
mortality of persons at different age periods. He calls attention to the fact that  
“ while the mortality in early life has been very notably diminished, the mortality 516.  
“ of persons in middle or advanced life has been steadily rising for a long period  
“ of years.” He adds, “ That the sanitary efforts made of late years should have  
“ more distinctly affected the mortality of the young is only what might be naturally  
“ anticipated; for it is against noxious influences to which the young are more  
“ especially sensitive that the weapons of sanitary reformers have been chiefly  
“ directed.” He further suggests that the enhanced mortality at later ages may in  
part be due to the indirect influence of sanitation by preserving from early death a  
vast number of children of permanently unsound constitution who so diminish the  
healthiness and add to the death-rates of later ages. At any rate there is evidence to  
disprove the assertion that sanitation in the wider sense must affect mortality at all  
ages equally.

140. Again, it has been fairly urged that, in order to ascertain whether the shifting  
of the age incidence of fatal small-pox can be fairly attributed to vaccination rather  
than to sanitary reforms, it is desirable to institute a comparison between small-pox  
deaths or death-rates at different ages and other comparable diseases rather than with  
the deaths or death-rates from *all* diseases.

141. Dr. Ogle thinks that the zymotic diseases would be the better ones to compare 516.  
small-pox with, but he truly observes : “ It is impossible to make similar comparisons  
“ in the case of scarlet fever or measles, and diseases that only affect children. Fever 518.  
“ is the only one of the zymotic headings that you can take, because it is the only one  
“ that affects all ages to any extent. Fever is, therefore, the only which it is possible  
“ to subject to this kind of investigation.”

142. Now in regard to Typhus, which is not at the present time responsible  
for many deaths under five years of age, we learn that, comparing the earliest  
quinquennium which the Registrar-General’s figures enable us to use with the quin-  
quennium 1886-90, a fall of 46·9 per cent. in the children’s share, *i.e.*, from 6·4 per



cent. to 3·4 per cent. For the same period in the case of Typhoid fever (even when the necessary correction for varying classification in regard to remittent fever has been made) there is a fall of 51·7 per cent. in the children's share, *i.e.*, from 17·4 per cent. to 8·4 per cent. For small-pox (even without any correction for chicken-pox) there is a fall during the same period of the children's share equal to 36·9 per cent., *i.e.*, from 31·1 per cent. to 19·6 per cent.

Not only then do we find that in certain other zymotic diseases comparable with small-pox a shifting of age incidence of the deaths so that the children's share is less and the adults' share greater than was formerly the case, but the shifting would appear to be somewhat greater in the case of Typhus and Typhoid fevers than in the case of small-pox.

143. The diminution of mortality of infants side by side with increase of mortality of older persons, which has been claimed to specially indicate the influence of vaccination upon small-pox mortality, seems to be also true in a remarkable manner of influenza.

The Registrar-General in his Fifty-fourth Report institutes a comparison between the great influenza epidemics of 1847-48 and 1890-91, and calls attention to the fact that "the epidemic of 1890-91 was distinguished from the equally fatal epidemic of 1847-48 by the greater comparative severity with which it attacked persons of "middle age," and the table he gives shows that, while at ages under 15 there was a lower rate in the last epidemic, at ages from 15 to 55 there was an enhanced mortality, while above 65 there was again a reduction.

144. We find in these facts evidence that in diseases other than small-pox, and against which no artificial protective is invoked, there has been a change in the age-incidence of deaths and death-rates in the same direction as, and not very dissimilar in amount from, that which has been asserted to be distinctive of small-pox in consequence of the special influence of vaccination upon it. We are bound to conclude that a theory of causation which takes no account of these phenomena is unequal to an adequate explanation of the whole case.

145. If we are right in our conclusion that causes other than vaccination are operative upon the age-incidence of fatal small-pox, and if, as we hold, sanitary measures are influential upon small-pox mortality, and if it be true that "it is against noxious influences to which the young are especially sensitive that the weapons of sanitary reformers have been chiefly directed," we should naturally expect to find that in sanitary or healthy districts as compared with less sanitary or unhealthy districts the reduction of small-pox mortality would be greater among the young than among the adult population.

146. That this is actually the case has been shown in section 198 of our colleagues' report. It is true that the admitted fact is there referred to the greater opportunity afforded to town dwellers of catching small-pox and catching it early. We are, however, quite unable to agree with our colleagues that overcrowding upon area or within dwellings ought not to be regarded as an insanitary circumstance, and the fact remains that sanitation or environment, or at any rate means other than vaccination, exert a profound influence, not only upon the amount of small-pox mortality, but also upon its age distribution.

147. That vaccination cannot be accepted as an adequate explanation of the shifting of age incidence of fatal small-pox, or at any rate as the sole explanation of the phenomenon, is proved by the fact that a very considerable shifting has been observed in the case of deaths from small-pox of those certified to have been unvaccinated. Now it is only since the year 1881 that the Registrar-General has classified the deaths from small-pox into three groups, the vaccinated, the unvaccinated, and the "not stated." Confining our attention to the unvaccinated, we learn that of 3,746 deaths in the years 1881-93, 1,483 were under five years of age, or 39·5 per cent. Now it has been repeatedly stated that the normal proportion of deaths from small-pox under five to the total small-pox deaths last century (and vaccination apart) may be taken as 80 per cent. What then is the explanation of the reduction of the proportion by one half? It has indeed been alleged that vaccination may indirectly have produced the effect by reducing the amount of small-pox or controlling its virulence. If this explanation be regarded as satisfactory, it may equally be urged that any measures such as isolation and more efficient precautions against contagion may also exert a powerful influence, not only upon the amount of small-pox, but also upon its age distribution amongst the unvaccinated.



148. In this connexion it is not without interest to note the varying distribution of fatal small-pox according to age in the epidemic year 1871 in different districts of Scotland :—

|                                                           | Total Deaths. | Deaths under Five. | Deaths under Five, per Cent. of Total. | 816-9.                                |
|-----------------------------------------------------------|---------------|--------------------|----------------------------------------|---------------------------------------|
| Principal towns (with population above 25,000) - - -      | 886           | 195                | 22·0                                   | Public Health Repts., No. IV., p. 67. |
| Large towns (with population from 10,000 to 25,000) - - - | 143           | 32                 | 22·3                                   |                                       |
| Small towns (with population from 2,000 to 10,000) - - -  | 209           | 55                 | 26·3                                   |                                       |
| Mainland rural districts - - - - -                        | 183           | 25                 | 13·6                                   |                                       |
| Insular rural districts - - - - -                         | 11            | 0                  | 0·0                                    |                                       |

In Dundee the highest proportionate infantile mortality of all was observed, the per-centage under five being 28. *Ibid.* p. 71.

We are not aware of any statistics pointing to the more thorough vaccination of the populations in the rural and island districts; indeed there is reason for thinking that default is more common in those parts than in the towns; there is, however, evidence indicating that the greater healthiness of the country districts shows itself in the smaller proportion of the total deaths which occurs under five years. 26,867-26,875. 6th Report, App., p. 654.

We learn from the City Chamberlain of Glasgow (Vital, Social, and Economic Statistics of Glasgow, 1891) that while in Glasgow, in 1875-79, 45·02 per cent. of the total deaths from all causes were under five, and in the small towns 35·59 per cent., in the mainland rural districts the proportion was 26·77 and in the insular rural districts 19·90. We think it not improbable that the age distribution of deaths from such a disease as small-pox and the mortality from it at different ages may be largely governed by the extent to which, by precautions against contagion and by sanitary surroundings the disease is kept within bounds and prevented from securing foothold upon the settled population. Where the contrary conditions prevailed and the spread of the disease was permitted and promoted, as in London and other large towns last century, the preponderant proportionate mortality of children was what we should naturally expect.

149. The claim that a second vaccination or re-vaccination places a person in better position as regards attack or death from small-pox is based largely on the experience derived from re-vaccination of soldiers, and of nurses and attendants whose duties bring them into close relation to the disease.

It will be seen from the reports made to us that re-vaccination is by no means an absolute protection. At Warrington, of 64 re-vaccinated persons living in houses invaded by small-pox, eight were attacked, giving an attack rate of 12·5 per cent.

In London, of 108 cases of small-pox in re-vaccinated persons, seven were severe, and four, or 3·7 per cent., fatal, a fatality-rate higher than in the once vaccinated class.

150. The army, in obedience to numerous orders, has been very thoroughly re-vaccinated, and, in the opinion of Brigade-Surgeon Nash, "it is as perfect as endeavours can make it," and, indeed, he was unable to suggest any means whereby it could be made more thorough than it is. From the table he put in we learn that from 1860 to 1888 inclusive there were 3,953 cases of small-pox and 391 deaths in the army, giving a case mortality of 9·9 per cent. Considerable variation is to be observed in the attack rate, and the mortality in the re-vaccinated soldiers according to where they are stationed. Thus, in the year 1888, the attack rate among troops in the United Kingdom was one per 10,000, in the Colonies 3, in India 15, in Egypt 42, and the death rates were per 10,000 in the United Kingdom 1, in the Colonies 0, in India 1·4, and in Egypt 11·9. The explanation of these differences is to be found in the difference of the degree of exposure to contagion in different places. Thus in Cairo and Assouan in 1889 an excessive amount of small-pox among the troops was traced to this cause. There were 42 cases and six deaths, giving an attack rate of 12·2 per 1,000, and a death rate of 1·75 per 1,000, rates as high as those for the whole population of Warrington during the epidemic. 345. 3559. 3560. Vol. II., App. 8, p. 278. 3551.

The Army Medical Report for the year states :—  
"A detachment of the 1st Battalion Welsh Regiment was stationed at Assouan during the latter part of 1888 and the early part of 1889; during that time an outbreak of small-pox occurred among the native population, and the disease broke out among the troops; two cases also occurred on the voyage from Assouan to Cairo.



" Notwithstanding all the precautions taken in Cairo, and due regard having been paid to vaccination and re-vaccination, the disease kept on the increase, and in the month of May presented signs of doing so still further. The Welsh Regiment, which suffered most, was in Kasr-el-Nil Barracks, which are situated near a crowded thoroughfare and on the banks of a navigable river. It being more than probable that the disease was derived from natives, the Welsh Regiment, on the recommendation of the principal medical officer, was removed to Abbassiyeh, where the situation is healthier and intercourse with the natives could be prevented. Small-pox, the principal medical officer, Deputy-Surgeon-General Jameson, remarks, is always more or less prevalent among the natives in Cairo, and indeed throughout Egypt, and as there exists no means of segregating affected cases it is certain that patients in various stages of the disease are permitted to walk about, and to frequent the bazaars and streets to the great danger of the public."

After these precautions were adopted there appears to have been a considerable reduction in the amount of small-pox among the troops in Egypt.

In the report of the Army Medical Department for 1888, speaking of small-pox mortality in Bengal, it is stated, " The greatest number of cases occurred at Lucknow, 32 with five deaths; it is stated that all the men had been re-vaccinated, and the cases varied from being very mild to severe and confluent."

1,300a.  
22,211-  
22,222.  
31,013.  
6th Rep.,  
App., p. 687.

1837-1839.  
4734-5.

12,389-95.

151. The evidence in regard to the re-vaccination of nurses has been fully dealt with in sections 313-329 of the report. They seem to enjoy a greater immunity from small-pox than re-vaccinated soldiers; and instances are on record showing that attendants who have not been re-vaccinated have also enjoyed an immunity which has been remarkable. The table given in section 329 of the report compares the liability of taking three infections with the liability of taking one. Cases of small-pox have been instanced in attendants and nurses who have been re-vaccinated; in such cases it is generally noted that the re-vaccination was not successful. While some hold that an unsuccessful re-vaccination is of no account, others, in accordance with the teaching of Jenner and Bryce, regard it as indicative of insusceptibility and assert that as long as a person is liable to successful vaccination he is liable to take small-pox; and that, therefore, insusceptibility to re-vaccination indicates protection.

152. When we consider the large number of attacks and deaths by small-pox which have occurred amongst our thoroughly re-vaccinated army on foreign service, the attack rate of re-vaccinated persons living in houses invaded by small-pox at Warrington and Dewsbury, as well as the number and fatality of re-vaccinated persons attacked by small-pox in London, we are forced to the conclusion that the remarkable immunity recorded in the case of nurses in small-pox hospitals cannot be wholly accounted for by the fact that they have been re-vaccinated. In the hospital at Bicêtre during the siege of Paris, in the midst of a larger accumulation of small-pox patients than has ever been known before or since, the immunity of those attendants and doctors who had neglected re-vaccination was even more marked than in the case of the orderlies, who were nearly all re-vaccinated. We attach considerable importance to the narrative given by M. Colin of his experience as Chief Medical Officer to the Bicêtre Hospital during the siege. The point of his narrative is that while 15 of the re-vaccinated or well-protected hospital orderlies took the disease, not one of the 80 who composed the medical and nursing staff, so many of whom had neglected re-vaccination, was attacked. He says ("La Variole," 1873, p. 114): " Nous avons démontré, en deuxième lieu, que le personnel hospitalier de Bicêtre a été peu éprouvé par la variole, dont il ne se manifesta aucune atteinte parmi les quarante médecins et pharmaciens attachés à l'établissement, ni parmi les quarante religieuses qui soignaient nos malades nuit et jour, et qui habitaient le centre de l'hôpital; grand nombre de ces personnes cependant n'avaient point voulu céder aux conseils que je leur donnais de se faire revacciner." It is sufficiently clear that M. Colin, though an impassioned advocate of vaccination, was so struck by the complete immunity of the medical and nursing staff, who by their neglect of re-vaccination appeared to offer less guarantees of protection than the orderlies, nearly all of whom had been re-vaccinated under his own eyes, that he thought it necessary to attempt an explanation.

153. The theory he expounds is not original, it has been broached by other authorities, and is applicable to some other contagious diseases. M. Colin (pages 39 and 90) suggests that a certain tolerance is acquired by repeated exposure to contagion, and that in those who are not at once attacked the receptivity to the disease becomes exhausted. The theory may or may not be true, but it has often been observed that in cases in which nurses have taken small-pox from their patients it has been at such interval of time, usually about a fortnight after exposure, as would suggest that those who are very susceptible take the disease at once, and it is possible that, as M. Colin suggests,



those who do not thus fall ill acquire the immunity which repeated exposure tends to give. Dr. Gayton has called attention to the fact that many "nurses and servants, persons well vaccinated, suffered from sore throat and headache on their first exposure to small-pox contagion. It is reasonable to believe that their illness was the result of small-pox poison," but he doubts whether it would be correct to say that they had small-pox. Vaccination, especially if with matter of variolous origin, may, when performed at such a time prior to exposure as to pre-occupy the system, operate in the same direction. Homerton Report, 1875.

154. With a view to prove the truth of the theory that cow-pox is the small-pox of the cow—*variola vacciniæ*—and also to establish fresh lymph supplies, numerous attempts have been made by several observers in various ways to infect bovine animals with the virus of human small-pox. In the majority of the experiments the results have been negative. In a few, when the small-pox matter has been diligently rubbed into scarifications, or denuded surfaces, or punctures, certain results have been obtained which have been variously interpreted. The positive results have generally been redness, tumidity, or papules at the points of insertion. In some of the successful cases, appearances approaching what may be described as vesicular have been obtained, a few, indeed, have exhibited the physical appearances of vaccine inoculated on the calf; such vaccine results have sometimes appeared not at the points of insertion but at some distance from them. In none of the experiments have the usual signs of natural cow-pox been found to result. 168. 169. 12,283.

155. Some of the cases in which vesicular results were obtained are certainly open to the objection that under the circumstances under which the experiments were made, there was the possibility, and even the probability, that vaccine virus (accidentally communicated) accounted for these results. 5129. 24,091.

156. Matter obtained from the local products of such variolations of animals, when inoculated on human beings, in the hands of Chauveau and others, gave rise to small-pox, which proved to be infectious. In the hands of others, matter taken from the local results, even when these bore no resemblance to vaccine vesicles, after serial inoculations on animals and human beings, approximated so closely to the vesicles of ordinary vaccination as to be indistinguishable from them; in such cases there does not appear to be any ground for believing that the communicated disease, whatever its nature, is any longer infectious. 171-2. 12,292.

157. In order to obtain local results on human beings similar to those of ordinary vaccination, by the application of matter derived from human small-pox, it does not appear necessary to resort to the cow as an intermediary. One of the earliest experimenters who succeeded in variolating the cow, Dr. Thiele, of Kasan, described a method of storage and dilution of small-pox virus, whereby he was enabled to cultivate lymph giving results indistinguishable from vaccine. Dr. Walker, who carried on a large vaccination practice in London, in the beginning of the century, appears to have entertained similar views, and practised the dilution with water of the small-pox virus.—(Memoirs of Lettsom, Vol. iii., p. 351.) Vol. 1, App p. 68 (note).

158. Adams, in 1805, had already succeeded in obtaining perfect vaccine results, without rash, with small-pox lymph taken from a mild variety of that disease. Guillou, in 1826, again records the fact that all the local appearances of vaccination could be obtained with lymph of undoubted variolous origin. Indeed, results approximating to these appear to have been arrived at by some inoculators in the previous century, who claimed to give small-pox without fever or eruption, and with no other symptoms than those occurring on the inoculated arm; it was, however, pointed out that such modified variolation did not give the same immunity as that which usually occasioned an eruption.\* 4895. 24,891-24,907.

159. While it is probable then that the insertion of small-pox matter into the skin of a calf can produce vesicles similar in some cases to those obtained by the inoculation of cow-pox matter, we are not aware of any evidence to show that the inoculation of the pox of the cow on the human skin has ever produced small-pox. In this sense then cow-pox and small-pox are not convertible, and we think it is incorrect to speak of cow-pox as the small-pox of the cow.

160. Moreover, there is a considerable amount of evidence showing that morbid fluids derived from other and apparently distinct diseases can when inoculated give rise to vesicles like those of vaccine, not only in the cow but in the human subject. The virus of cattle plague, of horse grease and horse-pox, of sheep small-pox, and of syphilis, and it has been alleged the application of tartar emetic, have given rise to vesicles when intentionally or accidentally inoculated which differ from vaccine vesicles less than these differ amongst themselves. Matter obtained from some of these sources, 12,295. 12,174-12,233. 11,594-11,604. 11,540-5. 21,975. 11,484-7. 27,142.

\* Cf. Mudge, Dissertation on Inoculated Small-pox, p. 20; Bromfield on Inoculation, p. 44; Adams, A Popular View of Vaccine Inoculation, 1807. 8894-8900.



other than cow-pox, has been at various times used to start fresh strains of lymph for vaccination. If from such varied sources vaccine results can be obtained, it by no means follows that because from human small-pox a vaccine vesicle can under certain circumstances be raised, there is, therefore, any special or essential inter-relation between cow-pox and small-pox.

161. Various more or less speculative views have been advanced to account for the ascertained facts in regard to immunity towards disease, whether natural or acquired. It has, indeed, been suggested that acquired immunity is in some way connected with the chemical results upon the tissues of the febrile process by whatever means occasioned. This subject needs fuller investigation, but there is some evidence which at least suggests that diseases held to be specifically distinct may exert some kind of temporary antagonism towards one another.\*

162. Though small-pox and cow-pox still occur in many parts of the country, such outbreaks do not appear to be in any way associated as cause and effect, though special attention has been directed towards the discovery of such relationship. We therefore conceive the correct view to be, that among the various morbid fluids whose inoculation into the calf's skin can produce a "vaccine" result, small-pox matter is one, but this fact no more implies the identity of cow-pox and small-pox than does a similar result from the inoculation of other viruses imply the identity of either small-pox or cow-pox with the diseases furnishing such viruses.

163. The question very naturally arises whether, seeing that lymph from various sources has been from time to time set going, there is any difference to be observed between the various stocks in their influence upon subsequent small-pox. Unfortunately it is no longer possible to distinguish between the various stocks now in circulation. Neither is it possible, in view of the law against inoculation, to submit the present or fresh stocks to the variolous test. It has been plausibly conjectured that vaccine lymph of variolous origin, such as Woodville's, or that of Ceely and Badcock, and of other experimenters in the variolation of cows, may be of superior efficacy to that derived from cow-pox, horse-grease, cattle plague, &c.

164. It is by no means clear that lymph from sporadic cases of cow-pox obtained from time to time has been derived from the true cow-pox of Jenner as distinguished from those varieties which have been termed "spurious." We know that Jenner attached the greatest importance to such discrimination. Spontaneous cow-pox, which produced no erysipelas, and showed no phagedenic disposition, he regarded as spurious. "This disease," he said, "is not to be considered as similar in any respect to that of which I am treating, as it is incapable of producing any specific effects on the human constitution. However, it is of the greatest consequence to point it out here, lest the want of discrimination should occasion an idea of security from the infection of the small-pox, which might prove delusive."

165. It was the cow-pox derived from the greasy heel of the horse that gave the true cow-pox, according to Jenner; matter from the horse direct, he found, did not impart immunity towards small-pox.

In a later publication, he stated that he "found that some of those *who seemed to have undergone the cow-pox*, nevertheless, on inoculation with the small-pox, felt its influence just the same as if no disease had been communicated to them by the cow. This occurrence led me to inquire among the medical practitioners in the country around me, who all agreed in this sentiment, that the cow-pox was not to be relied upon as a certain preventive of the small-pox. This for a while damped, but did not extinguish my ardour; for as I proceeded I had the satisfaction to learn that the cow was subject to some varieties of spontaneous eruptions upon her teats; that they were all capable of communicating sores to the hands of the milkers, and that whatever sore was derived from this animal was called in the dairy the cow-pox. Thus, I surmounted a great obstacle, and in consequence was led to form a distinction between these diseases, one of which only I have denominated the *true*, the others the *spurious* cow-pox, as they possess no specific power over the constitution."

166. Investigations carried out under the medical department of the Local Government Board, and especially by Dr. Klein, have served to show the number and variety of the diseases of the teats and udders of cows, and the difficulty of accurately discriminating between them. In reporting on some of these diseases in 1887, Dr. Klein observed:—

"In view of this second differentiation of a definite disease from among the mass of cow diseases that show sores on the teats, the old division into true and spurious cow-pox has become manifestly insufficient. It is seen that the name 'spurious cow-

\* Jenner employed vaccination to render dogs immune against distemper, and De Carro claimed it as antidotal to the virus of the plague.

12,414.  
12,236.  
24,181-3.  
25,995.  
4619-4622.

27,125.  
L. G. B.  
M. O. Rep.  
1888-89 and  
1887-8.



“pock” has in all probability been used to cover a variety of sores, having essential differences in nature, just as until the time of Jenner the name ‘cow-pock’ had covered along with various other things the disease which we know as vaccinia. But it is one thing to have learnt the essential nature of those sores in the cow that are concerned with vaccinia or scarlatina in the human subject; and another thing to affirm the distinguishing characters by which those sores may be recognised from other sores that once on a time laid claim to being equally with them ‘cow-pox’ or ‘spurious cow-pox.’ Our new discontent with the name ‘spurious cow-pox’ does not at once give us a knowledge of the nature of those sores which remain on the list; and we are now learning that there are many different kinds of such sores.”

167. It is evident that the diagnosis of the various diseases which have been collectively termed cow-pox is no easy matter; and it is to say the least doubtful whether the many new stocks which have been put in circulation have been all of the same species. It is certain that several stocks have been derived from so-called “spontaneous” cowpox, as for instance that of Laforet, from which the National Vaccine Establishment was supplied, when the calf lymph station was inaugurated.

168. We regret that in the course of our inquiry we have not obtained from the experts who have favoured us with their views any satisfactory definition of “vaccination.” No definition of the term appears in any of the Vaccination Acts. Our late and much regretted colleague, Mr. Bradlaugh, we know attached great importance to this point.

169. Mr. Ceely, so far as we are aware, was the last in this country to apply the variolous test to a new stock of lymph. He thus tested 21 persons who had been inoculated at periods varying from 5 to 31 months previously with his matter got by variolating the cow. In every case some effect resulted; in nearly all papulo-vesicular elevations or “mother-pustules” appeared at the insertions. In a few there was slight fever which, in one case, proved to be infectious, and in one child with four fine scars, the result of the inoculation five months previously, there was an eruption of hard warty papules over the whole body, several of which suppurated. These experiments were held to prove that a certain amount of immunity had been conferred by the previous inoculation, although no control experiment was made to show the effect of the matter inoculated in the same way upon unprotected persons.

170. It is impossible now to distinguish the various stocks of vaccine in use, it is, however, clear that much of that now current in this country and abroad is not derived from cow-pox at all, and probably still less is derived from that special variety of cow-pox which Jenner regarded as the true or protective variety. It is scarcely probable, unless indeed it be held that all viruses that will give rise to the physical appearances of a vaccine vesicle when inoculated, are identical, that one and all should be endowed with precisely the same effects *quâ* immunity towards small-pox. If we had to express a preference for lymph derived from any of the sources described we should give it to that of variolous origin, provided always it has been rendered incapable of giving rise to infection.

171. In section 361 of our colleagues’ report, an analogy is suggested between vaccination against small-pox and Pasteur’s protective inoculations of animals with attenuated viruses to protect them against certain epizootics.

We have already given our reasons for doubting the assertion that the cow-pox is the small-pox of the cow, and it should be remembered that M. Pasteur, in borrowing the term “vaccination” to describe his inoculations, was careful to point out that the difference is great in some respects between the two classes of facts. (*Lancet*, November 6, 1880.) If, however, the view which regards vaccination as analogous to the Pasteur inoculations be correct, it may be of interest to follow out the analogy into practice.

172. The chief diseases of flocks in which protective inoculations have been tried on a large scale are anthrax and pleuro-pneumonia.

173. Experience, however, seems to prove that the protective inoculation of anthrax, while it gives rise to a certain amount of immunity for an indefinite period towards subsequent “experimental” inoculation with the virulent material, leaves the “vaccinated” animals still liable to infection in the natural way. Experiments in this country, in France and in Germany have not confirmed M. Pasteur’s original contentions. The tendency of modern opinion and practice appears to be rather in the direction of the adoption of the “stamping-out system” by the pole-axe, destruction of infected carcasses, and disinfection rather than of reliance upon the “stamping-in” system of protective inoculations. In the last report of the chief veterinary officer of the Board of Agriculture, we read that “Dr. Klein’s reports appear in the Report of the Medical Officer of the Local Government Board for the years 1881–82, but the results which followed his investigations were in direct conflict with the statement made by

27,129–  
27,132.

4278-9.

12,303-4.

Vol. IV.,  
App. 1,  
p. 412.

Board of  
Agriculture,  
Rep. under  
C. D. Ani-  
mals Acts  
for 1894.  
10,984.

26,007–  
26,014.



"M. Pasteur, since all the sheep vaccinated by Dr. Klein either died as a result of the injection of the vaccine material, or succumbed to anthrax when inoculated with the virulent material, after being what was considered immune to the disease."

*Ibid.*

It is further stated in a report by Professor Muller, of the Royal Veterinary School of Berlin, that "preventive inoculation of anthrax has not many, I may even say no, friends in Germany," and that "preventive inoculation was practised from 1882 till 1885 or 1886 in the provinces Saxony and Posen by four or five great landowners or farmers who have suffered great losses every year by enzootic anthrax, and were induced to try inoculation by the apparent good results gained in Parkisch. The virus was obtained in all cases directly from Paris. In the beginning these inoculations were repeated every year, but little by little they were discontinued. I believe that preventive inoculation is now fully abandoned in Prussia, and has not been practised during the last five or six years."

On the other hand we learn from Professor Muller that "the general opinion of scientific authorities in Germany is that the best measures against anthrax are a careful destruction of carcasses, and a most careful disinfection, and that inoculation will have no effect in lessening the loss caused by this disease."

174. In regard to pleuro-pneumonia, the experience seems to be very similar and to point to the conclusion that, while the "stamping-out" system of slaughter and disinfection appears to be adequate to the eradication of the disease altogether, such result cannot be obtained by protective inoculations.

The report of the Departmental Committee of 1888 on pleuro-pneumonia is to the effect that protective inoculation "cannot be depended on as an efficient means of exterminating pleuro-pneumonia." The Committee attached especial importance to the experience of the rival methods in the Netherlands. They stated:—

"We have, with your Lordship's approval, and the sanction of Her Majesty's Treasury, summoned before us M. Lameris, one of the Government veterinary surgeons, residing at the Hague. In view of the fact that Holland is the only country in the world from which, after having obtained a good foothold, pleuro-pneumonia has been eradicated, the evidence of this gentleman possesses considerable interest and importance."

"From the evidence of M. Lameris it appeared that for many years inoculation was practised by owners of cattle, and so impressed were they by the benefits which appeared to result from that operation, that they petitioned the Government to make the inoculation of cattle in Holland universal and compulsory. The Ministers, however, declined to accede to this request, not only on the ground of expense, but because of the difficulties attendant on the carrying out of such a law, and of obtaining sufficient inoculating material."

"In 1871 an order was issued for the compulsory slaughter of all actually diseased animals, compensation being paid out of the Royal funds. After three years, compulsory inoculation of suspected cattle was also employed, though not universally. These combined methods of treatment, however, although reducing the disease, failed to eradicate it, and therefore the system of stamping out was adopted, and since 1885 the Netherlands have been practically free from pleuro-pneumonia."

"M. Lameris was very decided in his opinion that compulsory vaccination could not have cleared his country of disease; that stamping out was the safest and most certain way of attaining this result, and proved, in the long run, to be the cheapest."

10,969.

175. In the case of sheep small-pox, which more closely resembles the small-pox of man than does any disease of the lower animals, and in which accordingly it was hoped, and declared by Sacco and others, that protection might be artificially secured, Dr. Seaton stated the accepted view when he said "no fact is more conclusively established than the utter worthlessness of vaccination for saving sheep from small-pox." (*Handbook of Vaccination*, p. 42.)

25,927-  
25,983.

176. Attention has recently been directed to protective inoculations against cholera, with more or less successful results; but while such protection may be a matter for individual choice, the sanitary vigilance carried out under public authority seems to have been strikingly successful in preventing the disease from spreading in this country.

*Reference III.—The objections made to Vaccination on the ground of injurious effects alleged to result therefrom.*

Simon, 1857,  
Papers,  
p. lxxvii.  
Vol. I., App.,  
p. 93.

177. It was at one time officially maintained that against "the vast gain" by vaccination there is no loss to count. Of the various alleged drawbacks to such great advantages the present state of medical knowledge recognises no single trace." The Select Committee of 1871 reported "that if the operation be performed with due regard to the health of the person vaccinated, and with proper precautions in obtaining and using the vaccine lymph, there need be no apprehension that vaccina-



"tion will injure health or communicate any disease." Even more recently this view has been re-affirmed in a pamphlet, entitled, Facts concerning vaccination for heads of families, "revised by the Local Government Board, and issued with their sanction," which states that "as to the alleged injury from vaccination, all competent authorities are agreed that, with due care in the performance of the operation, *no risk of any injurious effects* from it need be feared." 21,853.

We agree with our colleagues that, notwithstanding repeated and emphatic assertions to the contrary, the admission must without hesitation be made that risk attaches to the operation of vaccination. 1871 Committee, 3210.

178. The statements contained in sections 399-421 of the Report appear to us to give ample reason at least for hesitation in retaining compulsory vaccination in any form. We allude especially to the following statements, in which we generally concur:—

Section 399.—"It is not open to doubt that there have been cases in which injury and death have resulted from vaccination."

Section 409.—"It must not be forgotten that the introduction into the system of even a mild virus, however carefully performed, is necessarily attended by the production of local inflammation and of febrile illness."

Section 410.—"It is established that lymph contains organisms, and may contain those which, under certain circumstances, would be productive of erysipelas."

In section 413 we are told that vaccination may become exceptionally risky, through special circumstances over which, in our opinion, the parents can have little or no control, such as the prevalence of disease in the neighbourhood.

Section 417.—"It may, indeed, easily be the fact that vaccination, in common with chicken-pox, measles, small-pox, and other specific fevers, does occasionally serve as an exciting cause of a scrofulous outbreak."

Section 418.—"It is freely to be admitted that vaccinia, like varicella, does occasionally cause an irritable condition of skin which may last long, but it is exceedingly improbable that it is responsible for any substantial increase in the number of chronic skin diseases in children." And again, "Amongst the inconveniences connected with vaccination is the production of contagious forms of eruption, such as have been classed under the names of porrigo and impetigo contagiosa. These eruptions are not attended with any risk to life, nor by any permanent injury to health, and they are usually curable by simple measures. References to these eruptions have been made by many witnesses. Their occurrence has no doubt not unfrequently caused prejudice to the practice of vaccination." And in section 419 is recited the case of a child previously in good health, and vaccinated with calf lymph by means of a needle which had never been used before, who died about six weeks afterwards with severely ulcerated arms, and ulcers in several parts of the body and limbs. No precaution had been neglected, and the event could only, as in other similar cases, be attributed to what is known as idiosyncrasy on the part of the child, a peculiarity of health attended by exceptional susceptibility to the specific virus of vaccinia." 22,876-22,903. 23,029. 23,064-23,067.

In sections 420 and 421 it is pointed out that "It was at one time doubted whether syphilis could result (from vaccination), and it was even confidently asserted that it could not," but that "Facts which were, not long after the issue of Mr. Simon's report, brought before the profession, and which were carefully investigated, made it certain that the negative conclusion which had been arrived at was a mistaken one, and from that time no doubt can have been entertained by any that it is possible to convey syphilis in the act of vaccination."

179. Putting together all these admitted elements of danger, though each may be slight in itself, we think that the sum of them constitutes a very serious objection even to the modified form of compulsion favoured by our colleagues.

180. It appears to us that the case for even this modified compulsion is practically surrendered in section 437, where our colleagues insist on the right of parental option as to the lymph to be used, on the ground that the risk of syphilis from arm-to-arm vaccination, however slight, is "naturally regarded by a parent with abhorrence." We cannot understand on what principle a parent is entitled to refuse arm-to-arm vaccination, because he regards its risks with abhorrence, but is not entitled also to refuse the not unreal risks of calf lymph, though he also regards these with abhorrence.

181. We are not prepared to attach much weight to figures put in by Dr. Ogle, instituting a comparison between Leicester and the whole of England and Wales in regard to the changes in the infantile mortality from various diseases. To make such comparison valuable it would be, as Dr. Ogle seemed inclined to admit, better to compare an urban population similar to that of Leicester, but in which vaccination was thoroughly carried out. If we want to ascertain by the method of differences whether vaccination exerts a detrimental effect by increasing the mortality from certain infantile diseases, 27,197. 27,199-204.



it is surely imperative to see that the places or times compared differ as little as possible in respect of circumstances other than vaccination.

182. In the statistics which Mr. Biggs furnished we do not find any evidence that the increasing disuse of infantile vaccination in Leicester has prejudicially affected the mortality of young children ; on the contrary, there has not only been a marked reduction of the general death rate since 1875 but a reduction in the death rate of infants under one year, a rate which reached its highest point since 1838 in the period 1868-72, when vaccination was most thoroughly enforced.

183. We must remember that though machinery exists for registering the success of vaccination, there is no system for notification of untoward results, or any means other than the certificates for obtaining official information of the total number of deaths directly or indirectly due to vaccination. In Scotland there appears to be even less provision for inquiry into alleged ill-results than is the case in England.

184. Our colleagues hold that though some of the dangers said to attend vaccination are undoubtedly real and not inconsiderable in gross amount, they are relatively few in proportion to the amount of vaccination that is done. They suggest an analogy with railway accidents, as an example of a risk that is every day disregarded. They quote the figures given by Dr. Ogle as showing one death to 14,159 primary vaccinations.

We give reasons for thinking the number of deaths under-estimated, but accepting the ratio as correct, it is interesting to compare it with that of the number of railway passengers killed to the total number of passengers.

| Year. | Number of Passengers Killed from causes beyond their own control, from Accidents to Trains in the United Kingdom. | Number of Passenger Journeys (exclusive of Journeys by Season-ticket Holders). | Proportion returned as Killed (from causes beyond their own control) to Number carried. |
|-------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1881  | 23                                                                                                                | 622,160,000                                                                    | 1 in 27,050,435                                                                         |
| 1882  | 18                                                                                                                | 654,838,295                                                                    | 1 in 36,379,905                                                                         |
| 1883  | 11                                                                                                                | 683,718,137                                                                    | 1 in 62,156,194                                                                         |
| 1884  | 31                                                                                                                | 694,991,860                                                                    | 1 in 22,419,092                                                                         |
| 1885  | 6                                                                                                                 | 697,213,031                                                                    | 1 in 116,202,171                                                                        |
| 1886  | 8                                                                                                                 | 725,584,390                                                                    | 1 in 90,698,049                                                                         |
| 1887  | 25                                                                                                                | 733,670,000                                                                    | 1 in 29,346,800                                                                         |
| 1888  | 11                                                                                                                | 742,499,164                                                                    | 1 in 67,530,000                                                                         |
| 1889  | 88*                                                                                                               | 775,183,073                                                                    | 1 in 8,808,875                                                                          |
| 1890  | 18                                                                                                                | 817,744,046                                                                    | 1 in 45,430,224                                                                         |
| 1891  | 5                                                                                                                 | 845,463,668                                                                    | 1 in 169,092,733                                                                        |
| 1892  | 21                                                                                                                | 864,435,388                                                                    | 1 in 41,163,589                                                                         |
| 1893  | 17                                                                                                                | 873,177,052                                                                    | 1 in 51,363,356                                                                         |
| 1894  | 16                                                                                                                | 911,412,926                                                                    | 1 in 56,953,307                                                                         |

\* Including 80 killed and 262 injured in collision near Armagh.  
*Number of season-tickets issued in 1894, 1,185,000.*

ENGLAND and WALES : DEATHS ascribed to VACCINATION, 1881-91.

| Year.         | Number of Deaths. | Primary Vaccinations. |
|---------------|-------------------|-----------------------|
| 1881 - - -    | 58                | 766,179               |
| 1882 - - -    | 65                | 764,518               |
| 1883 - - -    | 55                | 763,092               |
| 1884 - - -    | 53                | 766,338               |
| 1885 - - -    | 52                | 758,992               |
| 1886 - - -    | 45                | 755,337               |
| 1887 - - -    | 45                | 735,536               |
| 1888 - - -    | 45                | 720,991               |
| 1889 - - -    | 58                | 708,919               |
| 1881-89 - - - | 476*              | 6,739,902*            |
| 1890 - - -    | 43                | (Not yet published.)  |
| 1891 - - -    | 43                | (Not yet published.)  |

\* One death to 14,159 primary vaccinations.

We cannot help thinking that if railway statistics showed one death to 14,159 passengers, a railway journey would be a much more anxious affair than it is at present.

185. We are deeply impressed with the sad cases of severe illness and suffering and death which the investigations of medical men appointed by the Commission have, after

Vol. IV.,  
App. 3.

3887.  
28,016-  
38,021.

Sect. 434.  
Sect. 379.  
Sect. 403.  
6th Report,  
p. 647.

Accidents on  
Railways,  
Board of  
Trade  
Report, 1894.

Appendix.



rigid scrutiny, failed to disconnect from vaccination. We are also struck with the fact that under the circumstances which must obtain in the houses of the poor, additional risks to health and life are encountered, and that the operation cannot be regarded as free from even the more avoidable risks, except under conditions and precautions it is perfectly impossible to secure. To compel vaccination under such circumstances, even if its value were greater than it is, is in our opinion morally indefensible. It is with a sense of shame and amazement that we hear of instances in which parents who have lost one child from the effects of vaccination have been prosecuted and fined for refusing to submit another child to the operation.

6745.  
13,743.

186. Drs. Barlow and Acland found that about half the cases of vaccinal injury investigated by them (93 out of 189) were of inflammatory or septic origin, and other cases in which the question of syphilis had been raised (38) in many instances proved to belong to the inflammatory or septic category. They further state that "there are a certain number of cases in which, from causes which cannot at present be foreseen or prevented, serious results ensue from cutaneous eruptions, such as generalised vaccinia, impetigo, eczema, &c.," though in their experience the number is small. They "are of opinion that a certain proportion of children will always suffer after vaccination from various forms of cutaneous eruption. These seem to be more frequent after vaccination with calf lymph, and are for the most part free from danger, though often giving rise to considerable distress." They also think that "calf lymph as now usually employed tends to produce more severe inflammatory reaction than that which has been humanised."

In regard to the mode of vaccinating Drs. Barlow and Acland state they "have seen many cases of severe inflammation, abscess, erysipelas, and septic infection which have followed the use of some mechanical vaccinator," and further, that they "have frequently seen ulceration result from the insertions being placed too near together, so that the vitality of the tissues between them has been destroyed, and a slough produced."

187. Among the 32 fatal cases investigated by Dr. Luff, in which vaccination was a determining cause or factor in the fatal event, there were 22 of erysipelas, three of cellulitis, three of septicæmia, three of pyæmia, and one from exhaustion.

188. Dr. Coupland deals with injuries due to the quality of the lymph, and to septic infection, and adds a third category which he terms "Cases of deranged health, and even serious symptoms, evolved by the constitutional disturbance induced by vaccination in weakly or predisposed subjects." In reference to these cases he suggests that "unless small-pox were prevalent at the time it might often be preferable to defer vaccination for several months than to adhere too rigidly to the statutory age, irrespective of the condition of the child and its surroundings. In particular he deprecates the vaccination of very young infants, as is the practice in regard to workhouse children and those born in lying-in institutions."

189. We were surprised to learn that this highly objectionable practice has been approved and encouraged by the Local Government Board.

3963-6.

190. Erysipelas in varying degrees of severity is the most frequent of the ill results arising from or accompanying vaccination. It may amount to little more than an inflamed arm, or an extension of the areola which surrounds the vesicles on the eighth to the twelfth day, or it may be widespread and severe, affecting the cellular tissue, and may terminate in death. Deaths from "erysipelas after vaccination" were separately classified by the Registrar-General for England and Wales during the years 1859-80; there were 390 in all so certified. There is ample reason for believing that many other such cases have occurred, but in which no mention of vaccination appeared on the certificate of death.

14,796.  
13,835.  
13,839.  
14,819.  
14,453.  
15,270.  
15,355.

| Years. | Deaths from<br>Erysipelas after<br>Vaccination. | Years. | Deaths from<br>Erysipelas after<br>Vaccination. |
|--------|-------------------------------------------------|--------|-------------------------------------------------|
| 1859   | 5                                               | 1870   | 20                                              |
| 1860   | 3                                               | 1871   | 24                                              |
| 1861   | 2                                               | 1872   | 16                                              |
| 1862   | 3                                               | 1873   | 19                                              |
| 1863   | 11                                              | 1874   | 29                                              |
| 1864   | 13                                              | 1875   | 37                                              |
| 1865   | 10                                              | 1876   | 21                                              |
| 1866   | 10                                              | 1877   | 29                                              |
| 1867   | 4                                               | 1878   | 35                                              |
| 1868   | 9                                               | 1879   | 32                                              |
| 1869   | 19                                              | 1880   | 39                                              |

Vol. IV.,  
App. iii.,  
Table 3.



15,222.  
Vol. IV.,  
App., p. 478.

191. At an inquiry held by inspectors of the Local Government Board into certain deaths alleged to have been caused by vaccination at Norwich in 1882, it was shown that eight children suffered from erysipelas "due to some abnormal peculiarity or contamination of the lymph"; four of these died; in only one was vaccination mentioned on the certificate of death.

14,819.  
Vol. IV.,  
App., p. 466.

Another inquiry was made by the Local Government Board into cases of erysipelas following upon vaccination at Gainsborough in 1876, of which six died; in none of these was vaccination mentioned on the certificate of death, though the searching investigation which was subsequently made failed to dissociate the operation from the fatal erysipelas.

14,149.  
15,337.

Other inquiries have been made by the Local Government Board; in 1886 into three cases of fatal erysipelas after vaccination at Sudbury; in 1887 into a fatal case of erysipelas at a military hospital; and in 1889 into a fatal case of post-vaccinal erysipelas at New Humberston.

192. In addition to the above series of published reports of injuries of an inflammatory or septic character arising from vaccination, we find in a memorandum prepared by Dr. Ballard a selection of cases found among the older records of the Local Government Board. These include:—

1. A series of 19 cases of erysipelas from vaccination at Warrington, with five deaths, in 1871.
2. A case of serious erysipelas from vaccination with National Vaccine Establishment lymph at Stoke Newington in 1871, in which inquiry elicited that violent inflammation had occurred in others vaccinated with lymph from the same vaccinifer; the vaccinifer having an inflamed arm on the thirteenth day and a small abscess in the axilla.
3. Six cases of serious inflammation and three deaths in a series vaccinated with ninth day lymph from one vaccinifer at Appleby in 1873.
4. Several cases of erysipelas and inflammation with five deaths in a series of vaccinations at Chelsea in 1875.
5. Twelve cases of excessive inflammation, six of erysipelas with three deaths, two cases of axillary abscess, and one large ulcer in a series of vaccinations at Plomesgate in 1878.
6. Ten cases of erysipelas or abscesses with four deaths and several cases of eczema in a series of vaccinations at Clerkenwell in 1879, in which "it is clear that the erysipelatos contagion was imparted at the time of vaccination."
7. Three cases of extensive erysipelas from vaccination at Blandford in 1883.
8. Three fatal cases of erysipelas from vaccination at Sudbury in 1883.

193. Between 1st November 1888 and 30th November 1891, 132 cases of inflammatory or septic disease (mostly erysipelas), following vaccination and terminating fatally, were the subject of inquiry by the Local Government Board. They have been classified as follows by Drs. Acland and Coupland:—

#### Appendix.

|                                                                                                                                                            |   |    |                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cases in which vaccination was followed by glandular abscess - - -                                                                                         | } | 3  | Cases LXXXI., CXXXIII. and CLXIV.                                                                                                                                                                                                                                    |
| Cases in which vaccination was followed by cellulitis or sloughing and in which there is ground for supposing that the lymph or vaccinator were at fault - | } | 3  | Cases LX., XCIV. and CXCI.                                                                                                                                                                                                                                           |
| Cases in which vaccination was followed by cellulitis or sloughing, in which there is evidence of some extraneous source of danger - - -                   | } | 9  | { Cases XLII., LXXX., CIII., CXXXVI., CXXXII., CXLVI., CXLVIII., CLXXVI., and CCHII.                                                                                                                                                                                 |
| Cases in which vaccination was followed by erysipelas in which no extraneous cause was found - - -                                                         | } | 14 | { Cases XXIII., XXVIII., XXX., XXXVII., XLI., XLIV., LXXI., LXXXIX., XCVIII., CIX., CXXXV., CXXXVII., CXLIV. and CLXXXVIII.                                                                                                                                          |
| Cases in which vaccination was followed by erysipelas, in which there is evidence to show that either the vaccinator or the lymph were at fault -          | } | 32 | { Cases XVI., XXXI., XXXIV., XXXV., XL., LXV., LXIX., LXXXIII., LXXXIV., LXXXV., C., CI., CIV., CVIII., CXVI., CXVIII., CXX., CXXVIII., CXL., CXLII., CLV., CLXVI., CLXVIII., CLXIX., CLXXII., CLXXXIV., CLXXXIX., CLXXXV., CLXXXIX., CXC VII., CXC VIII. and CXCIX. |



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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cases in which vaccination was followed by erysipelas, in which there is evidence to show that there were extraneous sources of danger apart from the method of vaccination or the lymph - - - | 43 | Cases XV., XVII., XX., XXI., XXIV., XXIX., XXXII., XXXIII., XXXVIII., XXXIX., XLIII., LXII., LXVII., LXXXVI., LXXXVII., LXXXVIII., XCH., CVI., CXIV., CXVII., CXXII., CXXIII., CXXIV., CXXXI., CXXXIV., CXXXVI., CXXXIX., CXIV., CXLIX., CLI., CLII., CLVI., CLIX., CLXVII., CLXXV., CLXXVII., CLXXX., CLXXXII., CXC., CXCI., CXCV., CC. and CCII. |
| Cases in which vaccination was followed by erysipelas, in which the vesicles were irritated or the scabs injured - -                                                                           | 8  | Cases XVIII., XXII., XXV., LXVIII., CXIII., CXV., CL. and CLII'.                                                                                                                                                                                                                                                                                   |
| Cases in which vaccination was followed by ulceration of vesicles - - -                                                                                                                        | 4  | Cases CLXXXIII., CLXXXVIII., CXCIII. and CCI.                                                                                                                                                                                                                                                                                                      |
| Cases in which vaccination was followed by pyæmic or general septic infection and in which there is ground for suspecting that the lymph or the vaccinator were at fault - - -                 | 5  | Cases LXXXII., XCVII., CVII., CVII. (a) and CXXI.                                                                                                                                                                                                                                                                                                  |
| Cases in which vaccination was followed by pyæmia or general septic infection, in which there is evidence of insanitary surroundings or other sources of danger                                | 11 | Cases XXVII., LIV., LIX., LXX., LXXVIII., LXXIX., XCI., CV., CXII., CXXV. and CCIV.                                                                                                                                                                                                                                                                |
| Gangrenous, or phagedænic ulceration -                                                                                                                                                         | 1  | Case XIX.                                                                                                                                                                                                                                                                                                                                          |

194. Numerous cases, and two or three series of cases of post-vaccinal erysipelas, have been investigated by medical men appointed by the Commission. (See Cases 23, 115, 181, Appendix.)

Thus at some villages in Norfolk in 1890 there occurred a series of injuries from vaccination, which were investigated by Dr. Barlow on behalf of the Commission. In the course of March in that year some 16 children suffered from inflamed arms, several exhibiting secondary abscesses in the axillary glands, with subsequent wasting and great disturbance of health. Three terminated fatally; in one of these the death was certified to be due to "convulsions," in another to "pyæmia," and in the third to "asthenia, tabes mesenterica." Dr. Barlow's conclusion on these cases is as follows:—

14,890.

"Analysis of these cases shows that the progress of the vaccination in some respects diverged from the typical course.

In the majority there was a premature development of the vesicle, which within two or three days after insertion formed, broke, and discharged.

In several there was prolonged ulceration with free discharge, but not in the cases I saw any very deep loss of substance.

There was early and inordinate amount of inflammatory redness of the affected limb, and in some cases of the whole body.

In one case (XIII.) there was definite and severe erysipelas.

In two cases there was a large diffuse secondary abscess of the leg, which was very serious indeed, and accompanied by great exhaustion. I am informed that this condition was also observed in one of the fatal cases (C. W. W.).

In one case (No. II.) the local condition was, I am informed, distinctly subsiding, and there was no indication of secondary abscess; but the child died from convulsions. Also in XII. the local condition had quieted down, so that the vaccination sites were very small and scabbed over, and there were no indications of secondary abscess. But the child had sunk into a condition of marasmus with vomiting, and latterly green loose evacuations had been present. He succumbed the day after I saw him.

I think it important to observe that in both II. and XII. the feeding of these infants had been very bad.

For the most part, however, it is clear that the children had been previously healthy, and with two or three exceptions the mothers seemed to me to have been healthy. In two cases (VI., XIII.) there was reason to believe the mothers suffered from local inoculations from attending on their infants.



I saw no reason to think that the other children in the several cottages were unhealthy, with one slight exception (XIII.).

The cottages were fairly wholesome. There was no proof of the family health having suffered previous to the vaccination. The infants vaccinated were, with a few exceptions, well tended.

I could not ascertain that there had been any infectious fever prevalent in these villages which could have modified the vaccination in an adverse way.

To sum up from the brief provisional investigation that I was able to make of these cases, it appeared to me obvious that some septic material had been introduced at the time of the insertion of the vaccine lymph, and that this was mainly responsible for the untoward results obtained."

9835-8844.

Appendix.

(See also cases Nos. 5, 6, 7, 11, 14, 21, 27, 28, 30, 32, 36, 38, 39, 54, 72, 73, 81, 83, 86, 87, 88, 91, 96, 100, 104, 105, 106, 107, 108, 112, 114, 115, 116, 117, 118, 121, 122, 124, 125, 126, 135, 137, 156, 158, 161, 162, 165, 167, 169, 171, 175, 177, 179, 181, 183, 184, 185, 188, 189, 190, 197, 199, 200, 203, 204, 206, 207, 208, 211, 213, 215, 217, 218, 219, 220, 221, 235, 236, 239, 241, 242, 244, 245, 247, 248, 249, 253, 257, 258, 259, 260, 261, 262, 267, 268, 271, 312, 318.)

195. An account of a somewhat similar series of cases of septic poisoning occurring in the course of some vaccinations at Asprières (Aveyron) in 1885, in which several deaths occurred, will be found in Appendix IV. to the Third Report, p. 210.

196. The question has been much debated whether the erysipelas which accompanies or follows vaccination is due to accidental contamination, or is in some way incidental to or provoked by the changes which result from the insertion of the lymph. The question is not a new one. Jenner described "erysipelatous inflammation" as characteristic of the true as opposed to the spurious cow-pox. When this opinion of his was criticised, he replied, "In calling the inflammation that is excited by the cow-pox "virus, erysipelatous, perhaps I may not be critically exact, but it certainly approaches "near to it." And, indeed, he records an instance in which, in his opinion, the true cow-pox was excited in a herd of cows, and communicated to milkers, by matter derived from "an extensive inflammation of the erysipelatous kind, appearing without any "apparent cause upon the upper part of the thigh of a sucking colt."

197. The areola around the vesicles when at their height varies a good deal, and it does not seem possible to discriminate with precision between an exaggerated or indefinitely extended areola and erysipelas or erythema. We learn from bacteriological investigations that vaccine lymph contains a great variety of germs or micro-organisms, some of which are accounted to be pathogenic or disease-producing, and though none of them have been identified as the active principle of the vaccine disease, it seems clear that in some specimens germs believed by high authorities to be those of erysipelas have been encountered.

198. In view of these facts we are unable to regard vaccination as being as innocent of erysipelas as a prick of a pin or any ordinary surgical wound. While doubtless the treatment of vaccinated arms is frequently careless, and the surroundings of vaccinated infants often insanitary, and such circumstances may well provoke or aggravate untoward results, the evidence leads us to believe that vaccine lymph or the vaccine process is not unfrequently proximately related to erysipelas, inflamed arms, ulceration, sloughing, and axillary abscess.

199. Attempts have been made to discriminate cases of erysipelas following vaccination in which the disease is due to contamination of the lymph, from others in which some extrinsic cause is alleged. It has been suggested that the interval which elapses between the vaccination and the appearance of the erysipelas may enable the discrimination to be made. But the duration of the incubation period of erysipelas is variously given by authorities from a few hours to several days or a fortnight. In certain series of vaccinations, where several of the children vaccinated at or about the same time have been affected, and in which, therefore, the lymph was the probable medium of infection, the interval has varied from one or two days to two weeks, or even longer. It is therefore not possible to exonerate the lymph with certainty by means of any such criterion. It has also been argued that in cases in which one or two children only out of a group of several children, vaccinated from one and the same vaccinifer, subsequently develop erysipelas, that the lymph must be held blameless. But it has been specially remarked by Mr. Hutchinson that in cases of vaccino-syphilis it is not usually the case for all the co-vaccinees to be infected, though in such occurrence it is held that the lymph contains and imparts the superadded disease. (Illustrations of Clinical Surgery. Fasc. VI.) It is not at all improbable that the power of resistance in different children to the infection of erysipelas varies con-

4402.  
13,073.  
13,083-6.  
11,218-25.  
27,133.  
29,112-  
29,131.  
11,059-  
11,111.

Vol. IV.,  
p. 478.

Norfolk  
series.  
(Case 23.)  
Cases  
189, 200,  
203.



siderably, and it may well be that vaccine which usually evokes an areola or erythema of varying extent may in certain constitutions develop erysipelas or cellulitis. See Case 115 (series) in Appendix.

200. In a memorandum which accompanies the report of the German Vaccination Commission, it is stated that :—

“ At the time when the vaccination law was promulgated the opinion, prevailed generally that the dangers connected with vaccination to the life and health of the patient were unimportant, or rather, did not exist at all. Thus it is set down in No. 4 of the final conclusions of the opinion drawn up by the Royal Prussian Scientific Deputation for Medical Affairs, dated February 28th, 1872, which document formed the principal basis for the projected law, ‘ that there existed no warranted fact in favour of a deleterious influence of vaccination upon the health.’ It was, however, seen subsequently, very clearly, that this thesis could not be upheld. In fact, very serious damage by vaccination has occurred anything but rarely, both before and after the promulgation of the vaccination laws. The more recent publications enumerate a great many cases of the transmission of contagious diseases by vaccination. Thus, up to the year 1880, 50 cases have become known in which syphilis inoculated with the vaccine caused illness to about 750 persons (Lotz on Small-pox and Vaccination, 1880, page 113). A few separate cases of vaccine syphilis may perhaps be looked upon as being uncertain, but, on the other hand, others were not made publicly known, so that the figures quoted above are likely to be less than the number of cases that happened in reality. Still greater dangers than those connected with vaccine syphilis are threatened by vaccine erysipelas, which, as is now generally admitted, are far from uncommon. It is true that in many cases erysipelas may not be absolutely ascribed to vaccination, notably in the case of separate illness or the so-called late-erysipelas. However, a number of cases of general illness taking place *en masse* have been registered, which happened immediately after vaccination, and, in accordance with the latest experience derived from the etiology of erysipelas, admit of no other explanation beyond their having been caused by vaccination direct. Other diseases also have been transmitted by vaccination, or at least the possibility of such transmission must be admitted.” 9957-61.

201. In regard to vaccine syphilis, in the pamphlet revised by the Local Government Board, and until recently widely circulated, it was stated :—

“ The fear that a foul disease may be implanted by vaccination is an unfounded one. Such mischief could only happen through the most gross and culpable carelessness on the part of the vaccinator; and as all medical men now receive special training in vaccination, no risk of this kind need be at all apprehended. Of course, vaccination, like everything else, requires a reasonable amount of care in its performance. *The alleged injury arising from vaccination is, indeed, disproved by all medical experience.*” 21,854.

It was not only maintained that care could prevent all ill results, but it was asserted on high authority that “ a well-formed vaccine vesicle is certain proof of a pure and unmixed ‘ vaccine lymph ’ ”; that a syphilitic vaccinifer must betray evidence of disease sufficient to forewarn the careful, and it has been stoutly maintained that it was the presence of blood in the lymph that occasioned the danger of transmitting syphilis, and that as all lymph sent out in tubes from Whitehall was microscopically examined so as to exclude the presence of blood cells, the danger was infinitesimal. Simon's 1857 Papers, p. 138. 21,853.

202. We agree with our colleagues that the possibility of vaccine syphilis, formerly denied, has been fully established. Section 420.

203. In this connection we recall the words of the late Sir Thomas Watson, F.R.S., late President of the Royal College of Physicians. Alluding to the risk we are considering he said (‘ Nineteenth Century ’ June, 1878) : “ I can readily sympathise with, and even applaud, a father who, with the presumed dread or misgiving in his mind, is willing to submit to multiplied judicial penalties rather than expose his child to the risk of an infection so ghastly.”

204. We agree with Mr. Hutchinson that “ it is absurd to assert that inherited syphilis is always to be detected, and it is a cruel injustice to imply that all accidents [of this kind] have been the result of carelessness.” Sir J. Simon has published a later view in which he states that “ it is certain that the vaccine lymph of the syphilitic infant may possibly contain the syphilitic contagium in full vigour, even at moments when the patient, who thus shows himself infective, has not on his own person any outward activity of syphilis.” Archives, October 1890, 30,943-4. Quain's ‘ Dictionary of Medicine,’ 182-30,971.

205. A committee consisting of Dr. Bristowe, Professor Humphry, Mr. Hutchinson and Dr. Ballard, reporting upon a well-known case, said “ it is conclusively proved that it is



Report,  
L. G. B.,  
1882-3.  
M. O. H.  
supplement.

“ possible for syphilis to be communicated in vaccination from a vaccine vesicle on a syphilitic person, notwithstanding that the operation be performed with the utmost care to avoid the admixture with blood.” And it is recorded that in this case the vesicles from which the lymph was taken were described as “ normal in appearance and not inflamed.”

27,327-9.  
Sect. 430.

206. Dr. Husband, of the Vaccine Institution of Edinburgh, has established the fact that all lymph, however pellucid, does really contain blood cells. This not only disposes of the theory that lymph may be rendered innocent of harm if blood be excluded, but appears to render somewhat superfluous the labours of the microscopical examiner of lymph at the National Vaccine Establishment at Whitehall. Such microscopical examination of lymph, being directed mainly to the exclusion of that which according to Dr. Husband is omnipresent, and being admittedly insufficient to detect and identify micro-organisms of pathogenic nature, it is not suprising that it affords no guarantee of the purity of lymph.

4059-70.  
4140.  
4159.  
4173.  
4199-4200.

207. There is ground for believing that other cases have occurred which circumstances have prevented others from making public. Mr. Ward in giving evidence on the Leeds case incidentally referred to other cases.

10,215.  
23,666.  
21,854.

208. A list of cases of vaccino-syphilis will be found on page 617 of our Sixth Report. Not only is the danger of vaccine syphilis now admitted to be “ real and very important,” but the safeguards which have been laid so much stress upon are now known to be illusory. It remains to be considered whether the use of calf lymph will, as has been suggested, obviate the occurrence of syphilitic symptoms as the result of vaccination.

209. This subject is closely connected with what is known as the Leeds case of vaccino-syphilis. In view of the publicity which has been given to, and the importance of the issues involved in, this case, we think that the mode in which it has been dealt with in section 427 of our colleagues’ report can scarcely be regarded as satisfactory.

The child in question was vaccinated in March 1889, and died at the Leeds Infirmary on July 1 in the same year. An inquest was held at which Messrs. McGill, Ward, Littlewood, and Dr. Barrs, all members of the infirmary staff, testified to the fact that the child died from vaccino-syphilis. The verdict of the jury was that the child “ died from syphilis acquired at or from vaccination,” and a rider was added to the effect that “ when a parent requests calf lymph it is the duty of the medical man performing the operation to supply it if obtainable, or to explain to the parents his inability to comply with their request.”

On July 17, 1889, Dr. Ballard, one of the medical inspectors of the Local Government Board, received instructions, in the usual way, to inquire into the case, and he reported to the Board.

23,686.

On February 27, 1890, in reply to a question in the House of Commons, Mr. Ritchie, then President of the Local Government Board, stated that “ an inquiry has been made by an inspector of the Board with regard to the case. His conclusions are not the same as those arrived at at the inquest. He states that the child in question was the only sufferer from subsequent syphilis among all the children he reached and whom he saw that had been vaccinated with the same or any other lymph in the whole course of the vaccinator’s March vaccinations; and further that the entire family to which the alleged vaccinifer belonged were, as far as he could discover by examination of them, free from any syphilitic taint or suspicion of such taint. The report of the inspector will be at the disposal of the Royal Commission on Vaccination.”

23,701;

The above reply implies, and the report of Dr. Ballard states, that the child died from hereditary syphilis. He alleges that the family of the deceased child was “ a syphilitic family.” He adds, “ This conclusion is the direct contrary to that arrived at by the coroner’s jury, as also by the surgeons at the Leeds Infirmary. Both the jury and the surgeons formed their opinions on the evidence and statements they received. If both came to an incorrect conclusion, as I hold they did, it was because they had not before them the whole story, as I have discovered and narrated it, and they were consequently misled.”

210. Here the matter would probably have terminated as far as official inquiry went had the Commission not been sitting.

It was, however, agreed to ask Dr. Barlow to make an independent inquiry into the history of the case and the health of the family. He has reported to us that there is “ no evidence of syphilis ” in either parent of the child, and there is “ no evidence of inherited or acquired syphilis ” in either of the two elder children, and further, he adds, “ nor does the history of the third [deceased] child suggest to me that it was the subject of inherited syphilis.” On June 18, 1891, the results of Dr. Barlow’s inquiry were stated by the President of the Local Government Board in the House of Commons in reply to a question by Mr. Herbert Gladstone.



We have since examined Messrs. Littlewood and Ward and Dr. Barrs, who adhere to the opinion that the child died from syphilis acquired by vaccination, and confirm the opinion of Dr. Barlow that there was no suspicion of syphilis in the parents of the child or their elder children. 23,701-3.  
23,838-47.

Mr. Hutchinson has also in a publication (Archives of Surgery, Vol. 1, No. 2) added the weight of his testimony to the fact that there is no evidence of syphilis in any of the family.

211. What then was the nature of the disease from which the child died? This question involves the larger question of the relationship of cow-pox and syphilis, between which diseases Dr. Creighton suggests that there is a close analogy.

212. Our colleagues hold, in accordance with the opinion on the case which Mr. Hutchinson published, that "it may probably be classed with a few others as Sect. 427.  
" examples of gangrene and blood poisoning, the direct result of vaccination, which are  
" not to be explained by supposing the introduction of any syphilitic or other poison."

213. It has indeed quite recently been recognised that it is possible for vaccination, even where the matter has been derived from the calf, to give rise to a certain train of symptoms (including snuffles, thrush, eruptions on the genitals, bubo in the arm-pit, phagedænic sores and nodes), symptoms, which have hitherto been regarded as peculiar to syphilis, and which in some cases have been benefited by mercurial treatment. The real nature of such cases has given rise to much dispute; well-experienced surgeons, who saw these symptoms and examined them carefully, thought they could be none other than those of syphilis. Others of high authority regard them as "vaccinia" in a severe form. Dr. Creighton explains all such cases, as well as those of vaccino-syphilis, as due to cow-pox without contamination by human syphilis. Whatever their real nature, it is impossible to refuse to recognise them as the direct consequences of vaccination. Fuller knowledge is required to explain them, but when the assertion is made that the transmission of syphilis by vaccination is exceedingly rare, it must be borne in mind that the fact that vaccination with calf lymph, and therefore independent of venereal contamination, is capable of evoking symptoms indistinguishable by experienced surgeons from those of syphilis, has only recently been brought to the notice of the profession. 21,989.

Mr. Hutchinson says these cases look to him quite as much like vaccinia as syphilis, and were so closely parallel that were syphilis conclusively proved in any one, he would be prepared to admit it in the others. Archives of Surgery, Oct. 1889. 21,989. Do., Jan. 1890.

The publication of these cases brought to light others of a similar kind, including several cases in the practice of a public vaccinator in which the four vesicles merged into one deep ulceration and took months to heal up, and another series in which the lymph had been taken from a child who was vaccinated from calf lymph from the Local Government Board. In this last series there was not the same gangrenous inflammation as in the others, but a persistent formation of scabs. (See also Cases 11, 21, 31, 35, 39, 113, 162, 167, 169, 175, 177, 183, 199, 202, 204, 206, 207, 208, 214, 241, 258, 326.) Appendix.

214. In view of the fact alluded to in our colleagues' report that these abnormal results may follow vaccination with calf lymph, the following words of Mr. Hutchinson are significant: "The final supposition is that it is possible for vaccination independently of any syphilis, whether implanted or hereditary, to evoke symptoms which have hitherto been regarded as peculiar to the latter malady, and which are apparently greatly benefited by specific treatment." Archives of Surgery, Jan. 1891. 21,975.

215. This view of the affinity and results of cow-pox is that which was foreshadowed in the writings of Auzias-Turenne, and which in this country has been chiefly advocated by Dr. Creighton. 11,451. 21,973. 5573.

216. The remarkable increase of infantile syphilis, which some statistics show since 1853, has not received an adequate explanation. There is much to be said against setting the increase down to vaccination. We should only have expected vaccination to be to a very slight extent the cause of deaths from syphilis, and likely to be overshadowed by more potent influences, unless indeed there were ground for believing, as has been alleged on high authority, "that a large proportion of the cases of apparently inherited syphilis are in reality vaccinal." 10,205.

217. As regards leprosy, the evidence is conflicting. It appears to be a general opinion that among the various means by which the disease is propagated, inoculation is one; and this is held to be rendered more probable by the discovery of a bacillus which many authorities recognise as the cause of leprosy. This bacillus has been found by Arning in vaccine lymph. Several cases are on record in which the disease seems to have been conveyed to healthy persons by discharges from lepers gaining access to raw surfaces; and there are a certain number of individual cases in which medical men of 9991. 10,109. 18,895. 19,164. 10,094.



19,164-6.  
9993.  
18,106.

experience have concluded that vaccination has been the means of such communication. There is no doubt that in the West Indies, and in other leprous countries, a general suspicion exists that native lymph may transmit leprosy; but evidence of wholesale propagation by this means is scanty and inconclusive, the most suggestive instances being those related by Arning in the Sandwich Islands.

218. In addition to inflammatory and septic complications, vaccination not unfrequently gives rise to skin eruptions. These vary immensely in character, and it is only in the most exceptional cases that a vesicular or pustular eruption like that of variola occurs. It has indeed been remarked that "the wonder is not that vaccination should sometimes produce an exanthem, but that it should ever be without one." (Hutchinson, *Lectures on Clinical Surgery* I., i. 18.)

These secondary skin eruptions evoked by vaccination have by the French pathologists been termed *vaccinides*. They may be roseolous, or papular (Lichen or Prurigo) or eczematous or impetiginous in type. (Fournier, *Leçons sur la Syphilis Vaccinale*, pp. 129-33.) They may be very transient and trivial, or may become chronic and persistent, and in a few cases have caused death. (See Cases 12, 14, 25, 29 35, 82, 95, 98, 109, 120, 129, 130, 138, 173, 180, 193, 196, 208, 214, 240, in Appendix.)

219. In reference to the possibility of consumption, tubercle or scrofula being communicated or occasioned by vaccination, it is necessary to bear in mind the prevalent belief that these diseases are due to a specific organism, and the fact that it has been found that tubercular disease can be readily conveyed from infected animals to healthy animals or persons by the medium of infected animal products such as milk. It seems that in a few cases a local development of tubercle in the form of lupus has taken place at the site of vaccination (see case 26, also evidence of Mr. Dakers, VI Report, 21,219-83). In a few other cases the question has arisen whether constitutional infection of tubercle has not been evoked by vaccination. In a larger number of cases strumous symptoms, following upon the disturbance of health occasioned by vaccination, have raised the question of the relationship of the one to the other (see Cases No. 128; 52 (?); 89; and 131.)

Thus Professor Felix von Niemeyer has expressed the view that—

"The injurious influence which diseases have on the constitution, and thereby on the tendency to consumption, manifests itself most frequently and in the most lasting manner in earliest infancy. It is fortunate if children escape disease, particularly in the first years of their life, during which by far the most rapid development of the body takes place, and when by favourable or unfavourable external circumstances the foundation is laid, in a great measure, for a strong and robust, or a weak and delicate, health. Even vaccination may, by the febrile disturbance preceding the eruption, as well as by that accompanying the suppuration, both of which are never absent, and, according to my numerous thermometrical observations, sometimes reach a very high degree, considerably weaken, more especially those children who are not very strong, and may leave behind it the germs of a disposition to consumption."

The experiments of M. Toussaint indicate the possibility of inoculating tubercle upon animals by vaccination. A paper by M. Dumontpallier on a series of casualties from vaccination in Paris in the "*Rapport sur les vaccinations pratiquées en France*," 1875, tends to suggest a similar possibility in the human subject. While cases of this kind would appear to be rare, we have little doubt the explanation quoted from Dr. Niemeyer would hold good in a larger number of cases.

220. It will have been observed that the diseases which have been alleged to have been conveyed by vaccination are those which modern pathology has shown to be inoculable, and we are bound to conclude that it is possible in the act of vaccination to convey any disease whose cause can reside in the inflammatory lymph of a vaccine vesicle.

*Reference II.—Means other than Vaccination for diminishing the prevalence of Small-pox.*

221. We are quite unable to agree with those who have maintained that sanitary measures have little or no influence upon small-pox. We have already given our reasons for thinking that the teaching of the early sanitarians, like Howard and Haygarth towards the close of last century, initiated a new line of thought in the prevention of disease, and we believe the general improvement of the public health which then set in was due, in a large measure, to a greater sanitary activity, and that the falling off in the death rates of fevers and small-pox, as well as in the general death rate, is confirmatory of this view.

222. In speaking of sanitation we use the word in its widest sense; we are not speaking merely of drainage improvements, but we include the prevention of overcrowding on areas, or within houses and rooms, the proper constructions of dwellings, so as to permit thorough ventilation; the promotion of cleanliness by adequate water supply and the prompt removal of filth accumulations. Related to these measures, but in

22,648-50.

22,714.

770.  
930.



a somewhat different category, are means directed against contagion, the speedy separation (in suitable hospitals) of the infected from the healthy, the disinfection of persons and things, and the prevention of the propagation of the disease by inadvertent carelessness or by intentional inoculation.

223. If the view that attributes small-pox exclusively to contagion be well founded, it might indeed be possible to keep out the disease even from insanitary places by rigid isolation; but experience shows that some, even of the contagious diseases, are dependent for their extension and severity upon influences other than contagion. The Royal Commission on Infectious Hospitals in 1882, in their report, called attention to the fact that the opportunity for contagion which the presence of a small-pox hospital might afford to a particular neighbourhood, is insignificant as compared with other deleterious influences from which London suffers. The returns and maps showed "that a healthy neighbourhood in which a hospital has been planted, though to a certain extent injured, may yet be favourably compared as regards prevalence of small-pox with those localities in which from over-population and neglect of sanitary precautions the predisposing causes of disease are more deeply seated."

Report of  
R.C. in S.P.  
and Fever  
Hosps.,  
p. xxiii.

224. We agree with the epidemiologist Hirsch that "small-pox, as well as typhus, takes up its abode most readily in those places where the noxious influences due to neglected hygiene make themselves most felt." (Hist. & Geo. Path., Vol. 1, p. 481.)

225. We find our own great sanitarian, Edwin Chadwick, in formulating his conclusions on the prevention of epidemics, while urging the separation of the unaffected from the affected when an outbreak occurs, yet maintained "that cases of small-pox, of typhus, and of others of the ordinary epidemics, occur in the greatest proportion, on common conditions of foul air from stagnant putrefaction, from bad house-drainage, from sewers of deposit, from excrement-sodden sites, from filthy street surfaces, from impure water, and from overcrowding in private houses and in public institutions."

"That the entire removal of such conditions by complete sanitation and by improved dwellings is the effectual preventive of diseases of those species, and of ordinary as well as of extraordinary visitations."

226. There is evidence to show that in countries where, at the present time, sanitation has not made much advance, or where overcrowding, filth accumulation, non-isolation of the infected, and, in some cases, the continued practice of inoculation prevail, small-pox is still rife, in fact endemic, and its persistence is attributed to these causes, and that where these causes exist vaccination entirely fails to neutralise them.

227. Thus in the official sanitary reports from India, published annually, we find frequent references to the influence of such causes upon the prevalence and mortality from small-pox:—

In the Report on Sanitary Measures in India, in 1879–1880, p. 142, it is stated:—"The vaccination returns throughout India show the same fact, that the number of vaccinations does not necessarily bear a ratio to the small-pox deaths. Small-pox in India is related to season and also to epidemic prevalence; it is not a disease therefore that can be controlled by vaccination in the sense that vaccination is a specific against it. As an endemic and epidemic disease it must be dealt with by sanitary measures, and if these are neglected small-pox is certain to increase during epidemic times."

Again, in the report of the Army Commission of the Punjab for 1879, p. 186, it is stated: "Vaccination in the Punjab, as elsewhere in India, has no power apparently over the course of an epidemic. It may modify it and diminish the number of fatal cases, but the whole Indian experience points in one direction, and this is that the severity of a small-pox epidemic is more closely connected with sanitary defects, which intensify the activity of other epidemic diseases than is usually imagined, and that to the general sanitary improvement of towns and villages must we look for the mitigation of small-pox as of cholera and fever."

It is stated again in the Report for the Central Provinces, p. 206: "The past comparative immunity of the population had been attributed to efficient vaccination, and the people had accepted this protection, but their confidence has been shaken by the re-appearance of a severe form of this disease. The sanitary commissioner states that he directed a special report on the subject to be made with the following result: "During the early part of the year there had been a good deal of chicken-pock in Sambulpur town; that when small-pox broke out later on, it attacked those who had been inoculated, vaccinated, and had previously had small-pox or chicken-pock; 301 persons who had been inoculated took the disease; that 577 vaccinated persons were attacked and 729 unprotected persons, or 1,607 in all."

Again in the Report for 1884–5, p. 203, referring to the sanitary measures of the North-West Provinces and Oudh, it is noted: "The facts already stated show conclusively that the small-pox of 1884 was one of the most severe epidemics on record, and by far the most severe in these provinces since deaths were registered. We are thus



"brought face to face with the fact that notwithstanding the existence of an active vaccination service, small-pox swept over the provinces just as if there had been none. No doubt attacks and deaths had been prevented by the service, but it is clear that it has been incompetent to deal with the disease in its epidemic form."

Again, it is stated that, "as a matter of fact, the total vaccinations at all ages performed by this staff amounted to less than three times the number of deaths, and the operations under one year of age were not one and a half times the total deaths. These remarks are not intended to call into question the utility of vaccination. But in presence of the facts the question is a perfectly relevant one, namely, whether dependence can henceforth be placed on vaccination as a protection against a small-pox epidemic? The question of course answers itself. In ordinary years lives are no doubt saved, and lower small-pox death rates may be co-existent with numerous operations. But this and similar experience appears to show that the remedies, if such be available, will have to be extended beyond vaccination, and will have to deal with epidemic causes affecting localities and their inhabitants. If sanitary work be neglected no more dependence against small-pox epidemics can be placed on vaccination than can be placed on quarantine against invasions of cholera. The true remedies lie elsewhere altogether."

Inoculation is still practised in India, in many places, and in association with religious observances, in honour of Sitla, the goddess of small-pox. In Persia inoculation is still to a large extent the custom; small-pox is endemic and the majority of children suffer from the disease at an early age.

228. In Nubia and the Soudan inoculation is still practised, the disease being regarded as a necessity, and the mortality is stated to be high, especially among the blacks.

In Algeria small-pox is said to be endemic; the Arabs still practise inoculation, the most elementary precautions against contagion are neglected, and the treatment of the disease is like that in vogue here before the time of Sydenham.

229. There can be little doubt that social position and sanitary environment have a potent influence on the prevalence as well as on the fatality of small-pox.

Dr. Farr, before the days of compulsory vaccination, pointed out the effect on causes of mortality of the selection exercised by insurance companies. Death from the eruptive fevers among such selected lives was rare; among 4,095 deaths in the Equitable Society, during the years 1801-32, only one was from small-pox.

In the Norwich epidemic of 1819, Crosse noted that the epidemic was almost exclusively confined to the very lowest orders of the people.

The late Earl of Shaftesbury, in the debate on the Compulsory Vaccination Bill of 1853, observed that "it was perfectly correct that the small-pox was chiefly confined to the lowest class of the population, and he believed that with improved lodging-houses the disease might be all but exterminated."

230. In 1875 Dr. Farr constructed life tables based upon the vital statistics of, (1) All England, (2) Liverpool, and (3) healthy districts, in order to ascertain what effect healthy environment had upon zymotic diseases. His figures showed that—

For every MILLION BORN ALIVE there would die, according to the LIFE TABLES :—

|                     | In Healthy Districts. | In England. | In Liverpool. |
|---------------------|-----------------------|-------------|---------------|
| By small-pox - - -  | 2,359                 | 6,521       | 8,141         |
| By fevers - - -     | 28,146                | 38,107      | 76,563        |
| By measles - - -    | 6,912                 | 12,865      | 26,973        |
| By whooping-cough - | 10,234                | 15,161      | 34,021        |
| By scarlatina - - - | 21,403                | 30,021      | 38,302        |

Dr. Farr, commenting on these remarkable figures, states his opinion "that healthy sanitary condition as to food, drink, and cleanliness of person, house and city, stands first in importance; after it, but subordinately, come quarantine, vaccination, and other preventives, as means of subduing mortality; for the mere exclusion of one out of many diseases appears to be taken advantage of by those other diseases, just as the extirpation of one weed makes way for other kinds of weeds in a foul garden."

231. That the difference observed between the figures for Liverpool and the healthy districts is not merely due to the denser population of the former affording greater opportunity for infection, is, we think, shown by the fact that in industrial dwellings, where there is a considerable aggregation of persons upon area, but under superior sanitary supervision, there has been a marked immunity from small-pox. Dr. Southwood Smith long ago called attention to this fact (Results of Sanitary Improve-



ments, p. 17.), and we learn from the Secretary of the Improved Industrial Dwellings Company that, in 1880-82, there were but two deaths from small-pox among more than 15,000 tenants, while there were 3,268 small-pox deaths in those years in London with a population of 3,800,000.

232. At Warrington in 1892-3 Dr. Savill notes that a relation existed between small-pox rate and house rate. All but 11 of the 455 infected houses were rated at less than 16*l.* per annum, and 406 of them at 8*l.* and under; with the exception of these eleven, the small-pox was absolutely confined to the lower, or artisan, or working classes, whose gregarious habits pre-eminently favour the spread of the disease from person to person. Warrington Rep., p. 87.

233. At Dewsbury we learn from Dr. Coupland's report that the sanitary condition of the union was anything but satisfactory. In 1878 a disproportionately high mortality from fever had occasioned a special investigation. It was found that the mean death rate from this cause had been 8·3 per 10,000 in Dewsbury, against 4·1 in London and 5·4 in the large towns of England. Although some improvement has taken place since that time there is much still to be done, especially in the matter of excrement disposal and house construction. The back-to-back system of dwellings is still the rule, especially in Batley. With but few exceptions the incidence of the disease fell upon members of the working-class community. Associated with the staple industry of weaving is a very extensive rag trade, the rags come from all parts of the world, and consist of cast-off wearing apparel in all degrees of filthiness. Dewsbury Rep., p. 10.

Dr. Coupland observes that in the higher part of Batley, which is mostly residential, but few cases of small-pox occurred. Of the 266 houses in Batley that were invaded, and of which particulars were obtained, 171 had no through ventilation, 122 of these were back-to-back, and seven were cellar-dwellings. In Dewsbury more than 70 per cent. of the invaded houses had no through ventilation. At both places the proportion of cases of small-pox was larger in the houses where there was no through ventilation.

234. In reference to the question of the relation of sanitary measures to small-pox our attention was specially directed to an outbreak of the disease on board the steamship 'Preussen' in 1886. It was suggested that in such a case the influence of vaccination could be measured without the disturbing influence that sanitary circumstances are alleged to exert. The case appears to have attracted considerable attention, and was quoted by the President of the Local Government Board, in the House of Commons debate of July 22, 1887, as strikingly showing the efficiency of vaccination (Hansard 22, VII., 1887, p. 1799).

It was stated in evidence "that the Local Government Board in 1886 took some pains 994. to get the figures as to the steamship 'Preussen,' bound for Australia, on board of which small-pox broke out. You have, of course, on a vessel, people living under the same sanitary circumstances, eating very much the same food, and in all respects practically alike, with the one solitary exception of vaccination. There were 312 persons on board this vessel. Of persons both vaccinated and re-vaccinated there were 55, four of those were attacked by small-pox, none died. Of persons vaccinated but not re-vaccinated there were 209; 45 of whom were attacked by small-pox and three died; 13 persons had previously had small-pox, of whom three were attacked by small-pox and none died. Of persons stated to be vaccinated but showing no scars, there were 16, two of whom were attacked by small-pox, and none died. Lastly, there were 19 persons unvaccinated; 15 of these were attacked by small-pox, and nine died. This evidence is in expansion of that I gave, showing that sanitary circumstances have little or no control over small-pox when compared with the condition of vaccination or no vaccination."

235. Having examined Dr. MacLaurin, of Sydney, who had personal knowledge of the case, and the official reports from Melbourne and Sydney, we find:—

1. That the vessel was greatly overcrowded, carrying in all 723 passengers; the overcrowding led to a most insanitary state of things on board, and the vessel when inspected at Sydney was pronounced to be the filthiest ship the authorities there had ever had to do with. 5945-6.  
5952.

2. In addition to the cases of small-pox referred to in reply to Question 994 there were 29 cases among some 235 passengers who were disembarked at Melbourne. Of these cases 21 were vaccinated (nine with one mark, four with two marks, eight with three marks) of whom one died; seven were "doubtful" or "not stated" as to vaccination, of whom two died; one was unvaccinated and recovered.

3. There were also, in addition, the crew, numbering 120, who had been vaccinated and re-vaccinated; of these fourteen were attacked and one died. 5959-69.  
5971-5.

The official report from Melbourne states "it is impossible to doubt that the ordinary rules for the preservation of health and enforcement of decency were



“neglected, and we fear the most obvious precautions against the spread of small-pox were omitted.” Dr. MacLaurin, in his official report to the Sydney Board of Health, says, “Had the authorities at Albany, immediately on the ship’s arrival, removed the small-pox patient to the shore, and suitably disinfected the ship, it is reasonable to conclude that the terrible amount of suffering and danger which has since ensued might have been almost, if not altogether, averted.”

The facts do not appear to us to indicate that means other than vaccination have not a very potent influence over the spread of small-pox; and in this particular case it would seem that while small-pox paid little respect to vaccination or re-vaccination sanitation was conspicuous by its absence.

236. We believe that the growth of knowledge in regard to the mode of propagation and control of contagious diseases, both amongst animals and men, which has signalled the last hundred years, has a most important bearing upon the history and mode of dealing with small-pox.

237. In the earlier years of this century, attention was repeatedly drawn to the great danger of spreading small-pox by carelessness in regard to contagion, and especially to the practice of inoculating out-patients at the small-pox hospital, and then allowing them to wander about in all stages of the disease. Mr. S. Bourne, M.P., in the House of Commons said, “If we were to prescribe a mode of spreading the contagion of small-pox, it would be difficult for human ingenuity to devise anything better adapted for the purpose than to inoculate out-patients at the small-pox hospital to the amount of 2,000 in a year, and for these out-patients to resort there twice a week to be inspected.” The objectionable practice of inoculating out-patients was at last given up at the hospital in 1808.

In 1813 Lord Boringdon introduced into the House of Lords a Bill “for more effectually regulating the spread of infection from the small-pox.” He read documents from which it appeared that “owing to the constant open exposure of those who were inoculated with the small-pox in all stages of the disorder, great numbers were infected.” Lord Ellenborough, in the debate which followed, pointed out that such exposure might be dealt with by indictment under the common law.

In 1815 the National Vaccine Establishment prosecuted in the King’s Bench for the exposure of a small-pox patient after inoculation, whereby eleven persons were infected. The Court, in view of this being the first indictment of the kind, sentenced the offender to only three months’ imprisonment.

238. The writings of Rast, Haygarth, Faust, and others, published before the advent of vaccination, showed the enormous change which was taking place in the minds of medical men in regard to part played by contagion, and therefore also in regard to the amenability of epidemics to human interference, (*see* sections 456–458 in the report of our colleagues).

239. Some of these writers, like Rast of Lyons, denounced the practice of inoculation as not only fundamentally wrong in principle, in that it tended to keep alive the contagion, but also as a failure in practice, in that it had actually increased the share of the total mortality borne by small-pox. He proposed in 1763 a system of isolation in extra-urban hospitals very like that which we have seen adopted in our own day. Haygarth’s writings did much in this country and abroad to familiarise the public and the profession with the possibilities of hospital isolation as a preventive as well as a therapeutic agency, alike in the case of fevers and small-pox.

240 Thus we find in the Medical and Chirurgical Review for the year 1796 (the year in which Jenner performed his first vaccination) a criticism of a work by Faust, of Leipzig, entitled:—“An essay on the Duty of Man to separate persons infected with Small-pox from those in Health, hereby to effect the Extirpation of that Disease equally from the Towns and Countries of Europe,” in which it is stated . . . . . Thus it is proved that the small-pox is not a necessary or unavoidable evil of mankind; it can be annihilated, and ought to be; it is a sacred duty to deliver from its ravages the present and future generations, and we commit a heinous crime in not using the means in our power to put an end to so dreadful an evil. The question is by what means can this be effected? The whole mystery is explained in a single maxim. The first person ill in a place is the only source from which all the rest, perhaps hundreds and thousands, become affected; let him be put immediately into a situation where he cannot injure by contact those who have not had the disorder. It is the duty of the individual and of the community; it is a duty owed to society and to the human race. We observe this duty when a maniac becomes dangerous to society, and shall we omit it here where the danger is infinitely greater, and perhaps causes the deaths of thousands? And in the former, the separation lasts for years,



“ and perhaps during life, whilst in the latter it is only necessary for a fortnight or three weeks ; for the infectious period lasts only from the time of eruption to the complete falling off of the pustules. The principal means which M. Faust, therefore, points out for the execution of this great plan, are :—1. That people of all conditions should first be instructed by sensible writings that the small-pox is not necessary nor unavoidable, that its existence depends on our will, and that it is our duty to annihilate it. 2. A description of the disease with good ideas thereof should be circulated in all villages, in order that it may be immediately recognised. 3. Near each great town a moderately large house should be erected for the small-pox, and an inspector appointed. 4. All the inhabitants of towns and villages should contribute to its support. 5. As soon as any person is attacked with the disease he should be immediately removed to a house of this description . . . If these rules are duly followed, continues M. Faust, it may with certainty be depended on that in five or six years the small-pox will no longer be found to exist in the civilised part of Europe, just as the plague itself is extirpated.”

241. Even after vaccination had been publicly announced, we find in the same leading Medical Review, in 1799, an article on establishments for the extirpation of the small-pox in which mention is made of “ the ravages of small-pox since its first appearance in Europe,” and it is stated that “ since the year 1721 its mortality in Germany has been endeavoured to be lessened by the practice of inoculation. But the lists of mortality show that this desirable end is far from having been fully attained. Plans for total extirpation of the small-pox, therefore, have been suggested by philosophers of various countries, and the probability of being able to effect it is amply shown. To do this, however, the exertions of the physician are incompetent, unless they be aided by the powerful hand of Governments, but this has hitherto been withheld. *The grand means, however, of extirpating this destructive malady is an early and strict separation of the infected from those that are sound.* In the year 1796 the Prussian College of Physicians made a favourable report to the King on this project, when it was resolved to establish a house for the purpose in the city of Halberstadt. It is to be hoped that other countries will at length open their eyes to their true interest, and adopt a plan which cannot fail materially to affect the population of Europe. It will not be necessary then to attempt to disarm one disease of its powers by the introduction of another, the consequences of which cannot be fully known for a series of years to come.” 10,893.

242. Since vaccination was asserted to give the same protection as inoculation without spreading contagion, a point on which much stress was laid in the report of the House of Commons Committee on Jenner’s petition, its acceptance in lieu of the old practice appeared to offer a simpler and surer method of exterminating small-pox than the isolation methods which were being advocated, and these for a long time remained in abeyance while vaccination became the State-adopted method of dealing with small-pox.

243. In 1868 attention was again recalled to the value of isolation in dealing with small-pox by Sir James Simpson in a paper entitled a “ Proposal to stamp out small-pox and other contagious diseases,” in which the success which had attended the stamping out system in dealing with certain animal pests was cited as an illustration of what might be accomplished by an analogous system applied to the infectious diseases of mankind. 10,981.

The paper, which will be found at page 40 of the fourth vol. of our reports, is worthy of careful perusal. Sir J. Simpson’s contention in brief was :—“ For all that appears necessary for the purpose is simply the methodic temporary seclusion, segregation, or quarantine of those affected with small-pox, until they have completely passed through the disease and lost the power of infecting and injuring others. The pole-axe was the chief and leading measure required to stamp out rinderpest. *Isolation is the chief and leading measure required to stamp out small-pox.*” And he proceeded to show that by the Public Health Scotland Act of 1867, and less satisfactorily by the Sanitary Act of 1866 for England, the Legislature had for the first time made such action possible to local authorities.

244. It has been largely in consequence of the experience derived from the great epidemic of 1870–72, in which the failure of the compulsory infantile vaccination system became so apparent, that attention has again of late years been directed to the necessity of providing proper hospitals for isolation, and to the enormous influence of such isolation in limiting outbreaks of the disease. Dr. Seaton, the Medical Officer of Health for Surrey, in alluding to the experience of 1870–2 (Brit. Med. Jour., Feb. 29, 1896, p. 521), says :—“ The way in which the disease was seen to spread by the sometimes unavoidable



“ and sometimes careless exposure of infected persons and things at public-houses, laundries, provision shops, &c., as well as in the workhouses and common lodging-houses, forced attention to the question of isolation. This had hitherto been kept in the background by the habit of relying wholly on vaccination as the great preventive measure against small-pox. Under the influence of panic small-pox hospitals so-called were erected, but this did not take place anywhere until the disease had got firm hold of the population, and consequently they were little or no use in preventing epidemic diffusion.”

245. It is instructive to compare the behaviour of small-pox, typhus, and scarlatina in London during the years of registration for which the figures are available for each of these diseases. The following table enables us to trace the influence which sanitary reforms and hospital isolation have had upon each of these zymotic diseases :—

M. A. B.,  
Report for  
1895, and  
Reg. Gen.  
Report for  
1894.

| Years. | Estimated<br>Population in<br>the Middle<br>of each<br>Year. | Annual Death Rate per Million. |         |             |
|--------|--------------------------------------------------------------|--------------------------------|---------|-------------|
|        |                                                              | Small-pox.                     | Typhus. | Scarlatina. |
| 1838   | 1,766,169                                                    | 2,161                          | —       | —           |
| 1839   | 1,802,751                                                    | 352                            | —       | —           |
| 1840   | 1,840,091                                                    | 671                            | —       | —           |
| 1841   | 1,878,205                                                    | 561                            | —       | —           |
| 1842   | 1,917,108                                                    | 188                            | —       | —           |
| 1843   | 1,954,041                                                    | 224                            | —       | —           |
| 1844   | 2,033,816                                                    | 887                            | —       | —           |
| 1845   | 2,073,298                                                    | 438                            | —       | —           |
| 1846   | 2,113,535                                                    | 122                            | —       | —           |
| 1847   | 2,202,673                                                    | 434                            | —       | —           |
| 1848   | 2,244,837                                                    | 722                            | —       | —           |
| 1849   | 2,287,302                                                    | 228                            | —       | —           |
| 1850   | 2,330,054                                                    | 214                            | —       | —           |
| 1851   | 2,373,081                                                    | 448                            | —       | —           |
| 1852   | 2,416,367                                                    | 480                            | —       | —           |
| 1853   | 2,459,899                                                    | 86                             | —       | —           |
| 1854   | 2,503,662                                                    | 277                            | —       | —           |
| 1855   | 2,547,639                                                    | 408                            | —       | —           |
| 1856   | 2,591,815                                                    | 205                            | —       | —           |
| 1857   | 2,636,174                                                    | 59                             | —       | —           |
| 1858   | 2,680,709                                                    | 90                             | —       | —           |
| 1859   | 2,725,374                                                    | 425                            | —       | 1,277       |
| 1860   | 2,770,181                                                    | 324                            | —       | 726         |
| 1861   | 2,815,101                                                    | 77                             | —       | 846         |
| 1862   | 2,860,117                                                    | 128                            | —       | 1,221       |
| 1863   | 2,905,210                                                    | 687                            | —       | 1,706       |
| 1864   | 2,950,361                                                    | 185                            | —       | 1,097       |
| 1865   | 2,995,551                                                    | 214                            | —       | 727         |
| 1866   | 3,040,761                                                    | 457                            | —       | 622         |
| 1867   | 3,085,971                                                    | 436                            | —       | 470         |
| 1868   | 3,131,160                                                    | 191                            | —       | 929         |
| 1869   | 3,176,308                                                    | 87                             | 225     | 1,839       |
| 1870   | 3,221,394                                                    | 302                            | 147     | 1,875       |
| 1871*  | 3,267,251                                                    | 2,421                          | 118     | 582         |
| 1872   | 3,319,736                                                    | 537                            | 52      | 276         |
| 1873   | 3,373,065                                                    | 33                             | 82      | 191         |
| 1874   | 3,427,250                                                    | 16                             | 91      | 773         |
| 1875   | 3,482,306                                                    | 12                             | 37      | 1,056       |
| 1876   | 3,538,246                                                    | 207                            | 45      | 651         |
| 1877   | 3,595,085                                                    | 709                            | 34      | 439         |
| 1878   | 3,652,837                                                    | 387                            | 41      | 495         |
| 1879   | 3,711,517                                                    | 120                            | 19      | 717         |
| 1880   | 3,771,139                                                    | 124                            | 20      | 820         |
| 1881   | 3,824,964                                                    | 617                            | 24      | 553         |
| 1882   | 3,862,876                                                    | 110                            | 14      | 519         |
| 1883   | 3,901,164                                                    | 34                             | 14      | 514         |
| 1884   | 3,939,832                                                    | 307                            | 8       | 362         |
| 1885†  | 3,978,883                                                    | 347                            | 7       | 181         |
| 1886   | 4,018,321                                                    | 5                              | 3       | 172         |
| 1887   | 4,058,150                                                    | 2                              | 5       | 356         |
| 1888   | 4,098,374                                                    | 2                              | 2       | 295         |
| 1889   | 4,138,996                                                    | —                              | 4       | 190         |

\* Opening of Metropolitan Asylums Board Hospitals.

† Small-pox cases isolated out of London.



| Years. | Estimated Population in the Middle of each Year. | Annual Death Rate per Million. |         |             |
|--------|--------------------------------------------------|--------------------------------|---------|-------------|
|        |                                                  | Small-pox.                     | Typhus. | Scarlatina. |
| 1890   | 4,180,021                                        | 1                              | 2       | 206         |
| 1891   | 4,221,452                                        | 2                              | 3       | 142         |
| 1892   | 4,263,294                                        | 10                             | 3       | 273         |
| 1893   | 4,306,411                                        | 48                             | 1       | 369         |
| 1894   | 4,349,166                                        | 22                             | 1       | 222         |
| 1895   | 4,392,346                                        | 13                             | —       | —           |

These figures confirm the conclusion to which the other evidence points, that while sanitary reforms have been followed by a reduction of the mortality from small-pox and fever, the recent development of proper hospital isolation has been most strikingly effectual in reducing almost to insignificance the mortality from those diseases in the case of which it has been most largely resorted to.

246. Prior to 1867 organised removal and isolation of infectious disease in London 29,166-75. did not exist. The Metropolitan Asylums Board was then formed, but the epidemic of 1870 had begun before any approach to adequate accommodation had been provided. At first admission to hospital was dependent on the order of a relieving officer, accompanied by a certificate of a district medical officer; but these restrictions have been removed and the Metropolitan Asylums Board's hospitals are now free to *any person* reasonably suspected to be suffering from small-pox, fever, or diphtheria.

The effect of these increased facilities for treatment of small-pox in isolation hospitals has been that while in 1871-2 only 31 per cent. of the small-pox deaths occurred in hospitals, in 1893 87 per cent. took place therein.

247. On November 16th, 1881, a Royal Commission, of which two of our colleagues were members, was appointed to inquire into the nature, extent, sufficiency, advantages, and disadvantages, &c. of the Metropolitan Asylums Board's hospitals for small-pox and fever, and generally as to the operation of the Acts providing for the establishment thereof. In their report the Commissioners contrast the case of London with that of the provinces in regard to small-pox mortality; they say,—

“ We find that from 1871 to 1880 inclusive, the amount of disease in London “ relatively to the population, though less than that in several other great towns, has “ always been greater than that in England generally, and its rate of diminution “ has been slower. In London, however, as in the country, till about the year “ 1860, that diminution was always going on. Then a change took place. While the “ general provincial mortality continued to decrease, the quinquennial average mortality “ of London will be seen by the table to have risen from its minimum of 195 per million “ in 1861, to 396 in 1867, and to have continued at a somewhat lower but still compara- “ tively high rate till the statistics of metropolitan small-pox were disorganised by the “ exceptional visitation of 1871, and the reaction, amounting to virtual immunity of “ the years 1873, 1874, and 1875. During the six following years, 1876-81, the “ London rate of mortality has gradually risen, on the quinquennial average, to 393. “ Comparing this average with that of 1861, we seem for the last 21 years to have “ been grappling with an evil influence which is fitfully but sensibly gaining ground “ upon us . . . and which Dr. Munk, the experienced physician of the Small-pox “ Hospital at Highgate, believes to be increasing in the severe character of its attacks.”

They made certain practical recommendations several of which have been carried out; such as compulsory notification, disconnexion from the poor law, removal of small-pox patients out of London, and the disuse of the intra-metropolitan hospitals for small-pox. The Commissioners were led to hope “that the immediate and complete “ isolation which ought to be secured by these means will greatly diminish the amount “ of small-pox, scarlet fever, and typhus in London.”

They calculated that if their suggestions in regard to notification, &c., were acted on and produced the desired effect, three-fourths of the small-pox cases would find their way to hospital, and three-fourths of the deaths occur there, and thus both the average and maximum number of cases and the mortality from small-pox would be greatly diminished. This calculation has been more than realised, more than 80 per cent. of small-pox deaths in London now occur in hospitals.



They, however, state that, having regard to the 43 years of registration statistics, “ if we assume for the moment that the past is our best measure of the future, it would seem that we have to expect once in about 30 years an absolute mortality varying from 8,000 to 10,000 deaths, and, apart from these extraordinary outbursts, that the sickness of the remaining 41 years will be indicated by a mortality ranging—

In 3 years from 2,800 to 3,600.

„ 17 „ 1,000 „ 2,800.

„ 13 „ 400 „ 1,000.

„ 8 years being under 400.

—  
41 years.”  
—

and that an accommodation for 2,700 small-pox patients would accordingly be a more than safe estimate.

248. The actual deaths from small-pox in London in the years which have elapsed since the Commission of 1881 reported have been as follows:—

|      |   |   |   |       |
|------|---|---|---|-------|
| 1882 | - | - | - | 430   |
| 1883 | - | - | - | 136   |
| 1884 | - | - | - | 1,236 |
| 1885 | - | - | - | 1,419 |
| 1886 | - | - | - | 24    |
| 1887 | - | - | - | 9     |
| 1888 | - | - | - | 9     |
| 1889 | - | - | - | 0     |
| 1890 | - | - | - | 4     |
| 1891 | - | - | - | 8     |
| 1892 | - | - | - | 41    |
| 1893 | - | - | - | 206   |
| 1894 | - | - | - | 89    |
| 1895 | - | - | - | 55    |

It is in the highest degree satisfactory to find that the forecast, based upon the experience from 1838 to 1881, has not been verified by that of the subsequent years. London has not for two centuries been so free from small-pox as during the last ten years. In 1889 not a single death from that disease was registered in London; in 1887, 1888, 1890, and 1891 there were less than 10 per annum, and in not one of the last 10 years has the 400 minimum limit, which the Commissioners anticipated would be exceeded in 33 years out of 41, been surpassed. London, instead of comparing unfavourably with provincial towns in regard to small-pox mortality, has come to show better results.

249. To what cause is this remarkable decline of small-pox in London attributable? The excess of London small-pox in the past has been attributed to the relatively large proportion of the births that are unaccounted for as regards vaccination. Has the proportion become less of late? On the contrary, the returns to the Local Government Board show that the proportion of births not finally accounted for as regards vaccination in London has steadily increased from 4·3 per cent. in 1881 to 18·4 per cent. in 1892. We agree with our colleagues in thinking it impossible to attribute the decline to vaccination. In 1885 the Metropolitan Asylums Board began to convey small-pox patients by steamer to the floating hospitals on the Thames at Long Reach. In 1889 notification became compulsory in London, and nearly all the reported cases of small-pox have been promptly isolated in such a manner as not to occasion infection from hospitals in crowded neighbourhoods. The comparative immunity that London has enjoyed of recent years is no doubt due to this policy which has been so vigilantly carried out by the managers of the Asylums Board.

250. There are 400 beds in constant readiness at the ships, and additional accommodation is available at short notice at Gore Farm. On receiving telephonic or other communication at headquarters an ambulance proceeds with a nurse to where the patient is, and on receiving the certificate that the case is one of small-pox, and without any compulsion, the patient is conveyed to the wharf where the ambulance steamboat is in readiness. Here the patient is seen by a medical officer of the Board, to confirm the diagnosis or otherwise. There are three ambulance steamers comfortably fitted up so as to carry 100 acute cases at a time.



251. It is a matter of experience that it is easier to secure notification and isolation in the case of small-pox than in the case of any other infectious disease. The promptness and ease with which an outbreak of small-pox in Marylebone was dealt with successfully by the Board in 1894 afforded a striking illustration. 658.  
798.  
29,224-5.

252. The Asylums Board has no jurisdiction in regard to disinfection or vaccination, nor is there in London any machinery for quarantining the inmates of infected households. Investigations which have been made in London and elsewhere have emphasized the local and personal infectiveness of small-pox, and the pedigrees of localised outbreaks have been definitely traced to single importations. 29,301.

253. Attention has been of late drawn to the part played by tramps in the spread of small-pox. Mr. Scovell, of the Metropolitan Asylums Board, pointed out the need for greater supervision of "shelters," and for the enforcement of greater cleanliness on the part of the vagrant population who use them. "Small-pox," he says, "is usually found to be rife among the lower and more uncleanly portion of the population." Dr. Birdwood, who speaks from the experience of some 12,000 cases of small-pox, believes that attention to cleanliness and frequent ablutions prevent the spread of small-pox and diminish the amount of eruption; he cites the successful precautions taken against the infection of visitors to the small-pox ships, and the occurrence of discrete small-pox in babies, who are frequently washed, as evidence of the truth of his views. 29,232.  
29,274.  
31,376.

254. In the last report of the Metropolitan Asylums Board we read, in reference to the recrudescence of cases of small-pox in June 1895, that "the causes which produced this sudden spread of the disease were not far to seek. Of the 35 patients admitted during June, only six possessed a fixed home. Of the remaining 29, three were infected in a London infirmary where small-pox had been introduced by some undiscovered means in May, and seven were infected in another infirmary by the agency of a vagrant who developed small-pox shortly after his admission there. The remaining 19 were vagrants who possessed no lodging or no fixed lodging, or other persons of the lowest class of society, all of them sleeping, when they slept under a roof at all, in common lodging-houses, Salvation Army shelters, or the like." M. A. B.  
Report for  
1895,  
p. 152.

255. The experience of Glasgow shows in a striking fashion how influential are hospital isolation and sanitary reform upon the prevalence and mortality of typhus and small-pox, and how relatively slight is the effect of these agencies at present upon whooping-cough and measles.

During the last half century probably no large town has witnessed so great a change in its sanitary condition as Glasgow.

So late as 1842 the condition of its population was reported by Mr. Chadwick to the Poor Law Commissioners to be the worst of any he had seen in any part of Great Britain. Sanitation in the modern sense of the term scarcely existed. Typhus and small-pox epidemics devastated the city. In 1794 the Royal Infirmary was opened, and fever and small-pox were received into its wards, more from philanthropic motives than from any preventive intention. In 1862 the first municipal fever hospital was opened, and in 1876 the hospital treatment of infectious diseases passed wholly into the hands of the municipal authority, while hospital accommodation was made available for all classes in 1881. Meanwhile a City Improvement Act, and, in 1867, the Scotch Public Health Act had been passed, and in 1870 the first sanitary inspector was appointed. Since then extensive improvement schemes have been carried out, and municipal lodging houses and a municipal washing and disinfecting establishment erected.

The vital statistics bear testimony to the effect of these reforms.

#### DEATHS per 1,000 from :—

| —       | All Causes. | Zymotics. |
|---------|-------------|-----------|
| 1855-64 | 30·0        | 7·8       |
| 1865-74 | 30·5        | 7·3       |
| 1875-84 | 26·8        | 5·0       |
| 1885-94 | 23·1        | 3·8       |

256. No diseases have shown so remarkable a decline during the period under review as typhus and small-pox have done. Their parallelism is best seen in the two accompanying tables taken from a report of Dr. Russell, the able Medical Officer of Health for Glasgow. Evolution of  
Public  
Health ad-  
ministration,  
Glasgow,  
1895.



GLASGOW—Deaths and Death-rates per Million from TYPHUS for 40 Years (1855-94), showing Number and Per-centage which took place in Hospital for 30 Years (1865-94).

| Year. | Deaths. |              | Death Rate per Million. | Per-centage of Total Deaths in Hospital.* |
|-------|---------|--------------|-------------------------|-------------------------------------------|
|       | Total.  | In Hospital. |                         |                                           |
| 1855  | 460     | —            | 1,291                   | —                                         |
| 1856  | 439     | —            | 1,211                   | —                                         |
| 1857  | 549     | —            | 1,487                   | —                                         |
| 1858  | 504     | —            | 1,340                   | —                                         |
| 1859  | 381     | —            | 995                     | —                                         |
| 1860  | 408     | —            | 1,047                   | —                                         |
| 1861  | 475     | —            | 1,194                   | —                                         |
| 1862  | 533     | —            | 1,313                   | —                                         |
| 1863  | 671     | —            | 1,621                   | —                                         |
| 1864  | 1,138   | —            | 2,705                   | —                                         |
| 1865  | 1,177   | 612          | 2,749                   | 52·0                                      |
| 1866  | 596     | 273          | 1,361                   | 45·8                                      |
| 1867  | 497     | 219          | 1,112                   | 44·1                                      |
| 1868  | 367     | 184          | 806                     | 50·1                                      |
| 1869  | 970     | 507          | 2,089                   | 52·3                                      |
| 1870  | 544     | 282          | 1,154                   | 51·8                                      |
| 1871  | 284     | 117          | 577                     | 41·2                                      |
| 1872  | 182     | 90           | 368                     | 49·5                                      |
| 1873  | 68      | 35           | 136                     | 51·5                                      |
| 1874  | 113     | 59           | 227                     | 52·2                                      |
| 1875  | 96      | 51           | 192                     | 53·1                                      |
| 1876  | 92      | 61           | 183                     | 66·3                                      |
| 1877  | 70      | 52           | 139                     | 74·3                                      |
| 1878  | 39      | 33           | 77                      | 84·6                                      |
| 1879  | 55      | 45           | 108                     | 81·8                                      |
| 1880  | 39      | 28           | 77                      | 71·8                                      |
| 1881  | 48      | 37           | 94                      | 77·1                                      |
| 1882  | 31      | 26           | 60                      | 83·9                                      |
| 1883  | 50      | 36           | 96                      | 72·0                                      |
| 1884  | 26      | 22           | 49                      | 84·6                                      |
| 1885  | 15      | 11           | 28                      | 73·3                                      |
| 1886  | 24      | 20           | 44                      | 83·6*                                     |
| 1887  | 20      | 17           | 37                      | 85·0                                      |
| 1888  | 22      | 17           | 40                      | 77·3                                      |
| 1889  | 16      | 12           | 29                      | 75·0                                      |
| 1890  | 14      | 12           | 25                      | 85·7                                      |
| 1891  | 27      | 27           | 47                      | 100·0                                     |
| 1892  | 10      | 9            | 15                      | 90·0                                      |
| 1893  | 10      | 9            | 15                      | 90·0                                      |
| 1894  | 9       | 9            | 13                      | 100·0                                     |

GLASGOW—Deaths and Death Rates per Million from SMALL-POX for 40 Years (1855-94), showing Number and Per-centage which took place in Hospital for 30 Years (1865-94).

| Year. | Deaths. |              | Death Rate per Million. | Per-centage of Total Deaths in Hospital. |
|-------|---------|--------------|-------------------------|------------------------------------------|
|       | Total.  | In Hospital. |                         |                                          |
| 1855  | 203     | —            | 570                     | —                                        |
| 1856  | 127     | —            | 350                     | —                                        |
| 1857  | 399     | —            | 1,080                   | —                                        |
| 1858  | 113     | —            | 300                     | —                                        |
| 1859  | 201     | —            | 525                     | —                                        |
| 1860  | 347     | —            | 890                     | —                                        |
| 1861  | 131     | —            | 329                     | —                                        |
| 1862  | 27      | —            | 67                      | —                                        |
| 1863  | 349     | —            | 843                     | —                                        |
| 1864  | 300     | —            | 713                     | —                                        |
| 1865  | 26      | 3            | 60                      | 11·5                                     |
| 1866  | 104     | 17           | 237                     | 16·3                                     |
| 1867  | 32      | 5            | 72                      | 15·6                                     |
| 1868  | 3       | —            | 7                       | —                                        |
| 1869  | 2       | —            | 4                       | —                                        |

\* The above per-centages are as given by Dr. Russell. On the basis of the figures given in the second and third columns the per-centage for the year 1886 is 83·3.



| Year. | Deaths. |              | Death Rate per Million. | Per-centage of Total Deaths in Hospital.* |
|-------|---------|--------------|-------------------------|-------------------------------------------|
|       | Total.  | In Hospital. |                         |                                           |
| 1870  | 25      | 4            | 53                      | 22·2*                                     |
| 1871  | 184     | 89           | 374                     | 43·4*                                     |
| 1872  | 149     | 92           | 301                     | 67·2*                                     |
| 1873  | 228     | 170          | 461                     | 76·2*                                     |
| 1874  | 214     | 163          | 429                     | 73·8*                                     |
| 1875  | 2       | —            | 4                       | —                                         |
| 1876  | 8       | 6            | 16                      | 85·7*                                     |
| 1877  | 13      | 10           | 26                      | 90·9*                                     |
| 1878  | 2       | —            | 4                       | —                                         |
| 1879  | —       | —            | —                       | —                                         |
| 1880  | 2       | 2            | 4                       | 100·0                                     |
| 1881  | 2       | 1            | 4                       | 50·0                                      |
| 1882  | —       | —            | —                       | —                                         |
| 1883  | 7       | 5            | 13                      | 83·3*                                     |
| 1884  | 11      | 10           | 21                      | 83·3*                                     |
| 1885  | 6       | 6            | 11                      | 100·0                                     |
| 1886  | 2       | 2            | 4                       | 100·0                                     |
| 1887  | —       | —            | —                       | —                                         |
| 1888  | —       | —            | —                       | —                                         |
| 1889  | —       | —            | —                       | —                                         |
| 1890  | —       | —            | —                       | —                                         |
| 1891  | —       | —            | —                       | —                                         |
| 1892  | 6       | 5            | 9                       | 83·3                                      |
| 1893  | 26      | 24           | 39                      | 92·3                                      |
| 1894  | 5       | 5            | 7                       | 100·0                                     |

257. Grouping the figures for small-pox into quinquennia Dr. Russell obtains the following figures:—

| —       | Total Number of Small-pox Deaths. | Number of Deaths in Hospital. | Death Rate per Million. | Per Cent. of Total Deaths in Hospital.* |
|---------|-----------------------------------|-------------------------------|-------------------------|-----------------------------------------|
| 1855-59 | 1,043                             | —                             | 565                     | —                                       |
| 1860-64 | 1,154                             | —                             | 568                     | —                                       |
| 1865-69 | 167                               | 25                            | 76                      | 15                                      |
| 1870-74 | 804                               | 518                           | 324                     | 65*                                     |
| 1875-79 | 22                                | 16                            | 10                      | 73                                      |
| 1880-84 | 22                                | 18                            | 8                       | 82                                      |
| 1885-89 | 8                                 | 8                             | 3                       | 100                                     |
| 1890-94 | 37                                | 24                            | 11                      | 89*                                     |

and he adds, "These results are sufficiently striking without reference to a standard population. In the 10 pre-sanitation years there were 2,197 deaths from small-pox; in the 30 sanitation years 1,060. In the 10 years of imperfect isolation in hospital there were 971 deaths; in the 20 years of perfect isolation, 89." Dr. Russell holds that "prevention is the aim and the *raison d'être* of hospitals and sanitary organisation, and the evidence of the success of prevention, in so far as isolation is concerned, is and may be formulated as an increasing proportion isolated of a diminishing total quantity of disease existing."

258. While sanitary reform has been so strikingly successful in the case of typhus and small-pox, measles and whooping-cough show a steady persistency. "The preventive utility of hospital isolation in the case of measles and whooping-cough is limited by various circumstances." Dr. Russell finds "the preventive results of the isolation of measles in hospital are in any case small," and the same seems to be largely true of whooping-cough. "Taking the last five years, after sanitation has done its best, whooping-cough is still left in the position of the most fatal disease, with a mortality of 979, but now very closely followed by measles, 941."

#### DEATH RATES PER MILLION FROM:—

| —                | 1855-94. | 1890-94. |
|------------------|----------|----------|
| Whooping-cough - | 1,350    | 979      |
| Measles -        | 796      | 941      |

\* The above per-centages are as given by Dr. Russell. On the basis of the figures given in the second and third columns the per-centages for the following years are:—1870, 16·0; 1871, 48·4; 1872, 61·7; 1873, 74·6; 1874, 76·2; 1876, 75·0; 1877, 77·0; 1883, 71·4; and 1884, 90·9. And for the quinquennia 1870-74 and 1890-94, they are 64 and 92 respectively.



259. At Warrington, where in 1892-3, according to Dr. Savill, the Vaccination Acts had been so thoroughly carried out that more than 99 per cent. of the people, according to his census, are vaccinated, the want of proper isolation accommodation was held accountable for the extent of the epidemic. Dr. Savill says:—"It will be gathered from the foregoing narrative that insufficient or imperfect isolation was an extremely important factor in the causation of the Warrington small-pox epidemic 1892-3. This was owing partly, in some instances at the commencement, to a non-recognition of the cases; but it was due chiefly to an absence of hospital accommodation sufficient for the reception and isolation of the patients as soon as they were attacked and identified.

"The sanitary authority had neglected to act on the recommendations of their medical officer of health in this matter of hospital provision. The purchase of additional land for that purpose was contemplated in the summer of 1890, but it was not carried out until October 1892.

"It is rendered evident from a close examination of the facts of the epidemic that if the town of Warrington had possessed adequate hospital accommodation for infectious disease the epidemic would probably never have reached the dimensions it did, and the disease would in all probability have been limited to a few cases in certain quarters of the town."

Warrington obtained notification by a Private Act in 1879, and in the epidemic of 1892-3 only 16 cases out of the 667 escaped notification.

At the commencement of the epidemic the total provision for the hospital isolation of infectious diseases was 30 beds, or less than half the very lowest estimate of that required. As a consequence of this only 13 cases could be received into the Borough Fever Hospital by dangerously overcrowding every available space.

The hospital is situated in a rather thickly-populated part of the town.

It appears that an outbreak of small-pox in May 1892 (consisting of three imported cases and one secondary case) was effectually dealt with by isolation, disinfection, and quarantine; but on the 18th of the same month the medical officer of health reported to the sanitary authority that "up to the present time we have been able to cope with introduced cases notified from the borough, but, as I pointed out in February 1889, there is very great danger in treating small-pox cases in close proximity with a populous neighbourhood as Aikin Street is, and two full wards of scarlet fever in our own grounds."

It was not, however, until the epidemic had established itself in the town that additional accommodation was provided in September 1892, at some disused Iron Works in Dallam Lane. These were situated near the northern fringe of the populated part of the town, but there appears to have been ample opportunity for communication with the outside world, at any rate, during the height of the epidemic.

Owing to deficient hospital accommodation, 91 cases were left at home, either altogether, or for periods varying from two to 22 days after the appearance of the rash. The limit of hospital accommodation was twice reached, viz., on August 23rd, when the old hospital became full, and on November 12, when the new hospital was also full. Dr. Savill traces 308 and 102 cases respectively to lack of hospital accommodation at these periods of arrest of removal. The spread of the disease within the hospital and workhouse are also attributed to insufficient isolation and overcrowding.

In the preliminary outbreak in May 1892 the whole family was quarantined, and this may be the reason why this outbreak spread no further. With this exception, no measures for the actual removal and isolation of the healthy members of an infected household were adopted in the case of the Warrington outbreak, and though persons were enjoined to avoid contact with the infected, there is reason for thinking little care was exercised in this respect, and no efforts at regular daily inspection and supervision, such as those adopted at Leicester, appear to have been made.

In view of the limited provision for isolation, we agree with Dr. Savill, that "it is not to be wondered at that on this account the small-pox epidemic of 1892-93 reached the alarming proportions which it did."

260. The facts in regard to the methods adopted at Leicester and Sheffield will be found in sections 480-487 of the Report.

261. In regard to Gloucester, although we have not yet received the complete report of Dr. Coupland, we learn from him that the following circumstances contributed to the extension of the disease:—

1. "A main factor was the introduction of the disease into some of the public elementary schools."



2. The large and increasing proportion of cases retained at home; especially as "quarantine," which in the early periods was under supervision, came to be more a matter of advice than of control. Dr. Coupland believes that "the facilities of intercourse between neighbours will account for a great deal—in other words, the failure of isolation."
3. The hospital is situate within the city and was crowded to excess, there being at one time two and even four in a bed; it is possible that the hospital contributed to the spread, but it is difficult to prove this. On the other hand "there had been aroused a deep feeling against the hospital; the mortality amongst the children admitted into it had been very high, and this feeling could not be eradicated, although the accommodation was extended and the organisation improved. Thus it happened that the majority of persons remained in their homes up to the last weeks."
4. The small sanitary staff was overtaxed; and Dr. Coupland reports there were serious defects in hospital administration.
5. The hospital accommodation was afterwards increased and the administration improved; that these efforts were not more immediately successful was owing to the unwillingness of the people to enter the hospital which had so suffered in reputation.
6. Dr. Coupland, in comparing the experience of Gloucester with that of Leicester, points out that Leicester has the advantage of being better organised in its Sanitary Department, and its Medical Officer is not, as at Gloucester, engaged in private practice. There is more "sanitary vigilance" at Leicester and its sanitary staff is more numerous.

262. It is evident from the experience of Sheffield and Warrington that the most thorough carrying out of the vaccination laws will not prevent serious epidemics of small-pox, and that well-vaccinated towns cannot afford to neglect the provision of hospital isolation in order to prevent small-pox running riot in their midst.

263. The evidence leads us irresistibly to the conclusion that the simplest and most successful method of limiting and stamping out small-pox outbreaks is and always has been to separate the diseased from the healthy, and to disinfect infected places, things, and persons.

264. In so far as this is practised small-pox is restricted and extinguished, in so far as this is neglected it tends to prevail, *i.e.*, to become epidemic.

265. The principle to aim at, then, is that of universal exclusion from opportunity of infection. It is the opposite of the principle underlying the practice of inoculation, which is that of universal acceptance of the disease and its artificial "sowing" or "buying."

266. The method of isolation or exclusion, although it had been suggested by a few, had not received much attention until after inoculation and vaccination had been tried, without achieving that success which it had been confidently hoped and asserted by the advocates of each was likely to result therefrom.

267. The history of dealing with small-pox, where it has been a matter of any concern, has been the history of passage from superstitious fatalism, or passive indifference, through the paralysing acceptance of "epidemic constitution" as the all-sufficient explanation, to active attempts, by inoculation or vaccination, to anticipate the disease.

268. During the practice of these latter methods, and side by side with them, there has gradually grown up a mass of evidence proving the efficacy of early isolation of notified cases of small-pox, disinfection, and quarantine, in controlling outbreaks.

269. There is also evidence showing that certain countries, by virtue of their geographical isolation, have enjoyed practical immunity from small-pox. The experience of places so dissimilar as the Continent of Australia, the town of Leicester, and the County of London shows that, even with a considerable and increasing number of unvaccinated persons, an isolation system may be carried out with remarkable success.

270. Infantile vaccination as now enforced in the United Kingdom does not prevent epidemics. 1770.  
2988.

271. Notification and isolation appear to be accepted even in places where the greatest hostility to vaccination has been manifested. 5833.  
5820.

272. Those who trust to vaccination say:—Vaccinate your child before it is three months old, and so render it less liable to have small-pox badly if it should happen at some future date to come in the way of it. Those who trust to isolation say:—Small-pox is notified to be here, now. Let the healthy be separated from the sick, let the latter be isolated at home, or, if they cannot be properly attended to there, let them be



removed to a suitably isolated hospital. There can be no doubt that the latter is the stronger position of the two; and in practice it has been found to secure the intelligent co-operation of the public.

273. In accordance with the sub-head No. 2 of the reference to the Commission, we would suggest the following as the means other than vaccination which should be employed for protection of a community from small-pox:—

1. Prompt notification of any illness suspected to be small-pox. Improved instruction in the diagnosis of small-pox.
2. A hospital, suitably isolated, of adequate accommodation, in permanent readiness, and capable of extension if required. No other disease to be treated at the same time in the same place.
3. A vigilant sanitary staff ready to deal promptly with first cases, and if necessary to make a house-to-house inspection. The medical officer of health to receive such remuneration as to render him independent of private practice.
4. Prompt removal to hospital by special ambulance of all cases which cannot be properly isolated at home. Telephonic communication between Health Office and hospital.
5. Destruction of infected clothing and bedding, and thorough disinfection of room or house immediately after removal of the patient.
6. Daily observation (including, where possible, taking the temperature and inspection for rash) of all persons who have been in close contact with the patient during his illness; such supervision to be carried out either in quarantine stations (away from the hospital) or at their own homes.
7. Closure of schools on the occasion of the occurrence of small-pox among the scholars or teachers.
8. Hospitals and quarantine stations to be comfortable and attractive, and so administered as to secure the confidence of the public. Hospital treatment to be free to all classes, and compensation to be paid to those detained or otherwise inconvenienced in the public interest, at the public expense.
9. Tramps entering casual wards to be medically inspected, their clothing to be disinfected, and bath provided. The measures for detection and isolation of small-pox in common lodging-houses suggested in section 507 of the Report to be carried out.
10. International notification of the presence of small-pox, and special vigilance at sea-ports in communication with infected places, after the plan adopted in the case of cholera.
11. Attention to general sanitation—prevention of overcrowding, abundant water supply, and frequent removal of refuse.

*Reference V.—Alterations in the provisions of the Vaccination Acts with respect to Prosecutions for non-compliance with the Law.*

274. It must be obvious from what has been already said that we necessarily consider the legal enforcement of vaccination as inexpedient and unjust. We see no sufficient reason for withdrawing this particular medical prescription from the personal option which attaches to all other medical prescriptions or surgical operations; we do not think that medical authority or advice is likely to gain in confidence or respect, by the adventitious aid of the police, and fine and imprisonment. But even if vaccination were a more effective and trustworthy prophylactic than we hold it to be, we should still think the continuance of compulsion at the present time to be an anachronism. The Final Report of the majority of our colleagues appears to us to show this conclusively. The view there expressed of the value of vaccination differs very considerably from the opinion prevalent in and before 1853, the date of the first compulsory law. Whether such limited and conditional confidence in vaccination as is expressed in the report of the majority would have been held by the Parliament of 1853 to justify compulsion is of course a matter of opinion: but when we recall the unqualified assurances then given that universal efficient vaccination would secure universal immunity from small-pox, we must say, in our opinion, it would not.

275. Our inquiry has shown that medical opinion as to the degree of immunity afforded by efficient primary vaccination has been modified since 1853, the date of the first compulsory Vaccination Act. At that time the Epidemiological Society used its influence to get the Act passed on the ground that the whole medical profession was agreed on the certain efficacy of vaccination as a preventive. The evidence we have received shows that this agreement no longer exists. Amongst the professional witnesses who have favoured us with their views there are marked



differences of opinion as to the length of the period during which primary vaccination is effective. But not one of them has maintained Jenner's first claim that vaccination conferred a lifelong protection. 1755.

276. It is apparent from the history of legislation on this subject that the assumption underlying every amendment of the law was a strong and general belief that, if only the absolute universality of efficient primary vaccination could be secured, epidemics would be prevented, and practical immunity would be secured for the whole population throughout life. On the other hand we have it in evidence that the epidemic of 1871-3 was as severe and widespread as any experienced during this century, and that in the course of this epidemic "a very large proportion of the total small-pox deaths of adults was amongst people who had at some time or other been vaccinated." 12,913-22. 685.

277. It would seem, therefore, that there is a certain amount of discrepancy at the present day between the theory on which the compulsory law is based and the actual state both of fact and opinion.

278. Under these circumstances it has been suggested to us that the obvious remedy is to amend the law by making re-vaccination compulsory. But though such a course might receive a good deal of support from medical opinion, the evidence we have as to the condition of public feeling shows that it would be impracticable. 100-2, 118, 156. 11,635.

279. This condition of things can hardly be considered satisfactory. The law as it stands enforces, under penalty of fine or imprisonment, a practice once thought to be an effectual preventive of epidemics, and a practical safeguard for every individual vaccinated. But this prescription of the law is now generally recognised as insufficient unless primary vaccination be supplemented by secondary or repeated vaccination. The question thus arises whether it is just or expedient to enforce at the cost of much local discontent a preventive which does not secure the end proposed, and which confessedly cannot now be supplemented by the only measures which, according to the medical opinions quoted, could make it effective.

280. In support of a continuance and reinforcement of the present law it is urged that if primary vaccination be not an infallible preventive, at least it always lessens the severity of the disease, if caught, and diminishes the mortality. It is, however, doubtful whether such results as these would have been held to justify compulsion when it was first proposed. And we cannot shut our eyes to the fact that this shifting of the ground of compulsion has reopened the whole question in the minds of many who accept this modified view of the Jennerian practice. As Commissioners commanded to consider and report on "provisions of the Vaccination Acts with respect to prosecutions for non-compliance with the law," we cannot avoid a reconsideration of this issue, which has very much to do with the unsettlement of public opinion on the Acts in question. 18,042-3. 13,065. 13,143.

281. It cannot be denied that the law as it stands is of a very exceptional character. It is the only instance under our Constitution of the universal enforcement by fine and imprisonment of a surgical operation. In all other cases preventive sanitary law affects only outward circumstances, such as light and air, sewerage, overcrowding, public exposure of infected persons, and the like. In all such cases the social interests are so direct and predominant, and the individual claims affected are so slight, or so merely mercenary—as in the case of owners of insanitary premises—that the reasons for compulsion are simple and uncomplicated by any delicate question of personal rights. But compulsory vaccination goes beyond outward circumstances, and invades the integrity of the healthy body. It requires a wound, however slight, to be inflicted on every healthy infant born, and the contraction of a disease, however slight, of the successful cultivation of which the vaccinating surgeon must satisfy himself. The law gives the parent or guardian no option as to incurring the possible dangers of the operation. In all other cases he is allowed to decide on his own responsibility whether he will follow a particular medical prescription or not. But in this he must accept the operation with all its dangers, real or imaginary, at the dictation of the law. He may believe that he has lost previous children through the effects of vaccination. But nevertheless he must run the risk again, or be treated as a criminal. It may fairly be conceded that a compulsory law of this nature requires justification different both in kind and degree from that of laws affecting ordinary nuisances.

282. The case as put before Parliament in 1853 seemed exceedingly strong. But, unfortunately, it did not receive much discussion. It rested, as we have seen, on the practical unanimity of the medical profession in the opinion that universal primary



vaccination would extinguish small-pox. It was argued that the plague of small-pox was such as to justify exceptional measures. It was believed that vaccination had already come into such general vogue that only carelessness accounted for occasional neglect. And, finally, it was assumed that there were no dangers to be feared such as might perplex the consciences of parents.

283. The evidence we have received shows that the same position cannot be held now. Eminent medical men, some of whom have appeared before us, are now maintaining that the protection supposed to be afforded by vaccination, even though repeated, is almost entirely illusory. Some allow indeed that the disturbance of the constitution set up by vaccinia may during its brief continuance prevent the development of small-pox from inoculation. But in their opinion this protection is so exceedingly brief in its duration that it is of no appreciable value as a prophylactic against epidemics. Whether that opinion be scientifically justified or not, the fact that it is held by medical men of great scientific reputation has recently done much to encourage resistance to the law. Where doctors differ it seems difficult to resist the claim of parents to be allowed to choose for themselves which opinion they will follow.

284. In 1853 there were few or no signs of opposition amongst the population when called upon to submit to the law. There was a general acquiescence in the assumption that the abatement of the virulence of small-pox from the commencement of the 19th century had been due almost entirely to the voluntary and partial adoption of vaccination. Those who neglected it were reasonably suspected of doing so, not from any conscientious conviction, but from mere carelessness and indifference to social welfare. It seemed right in the opinion of the time, therefore, that they should be compelled to adopt an apparently harmless precaution, which was believed only to need universal enforcement to secure the whole nation against a deadly disease. If these anticipations had been realised there seems no reason to doubt that the law would have continued to be enforced with little or no friction.

285. But in no year after the enactment of compulsion was the number of deaths reduced below 1,500 until the year 1875. It was during the eighth decade of this century that resistance to the law began to spread widely; and the main point on which recalcitrants insisted was that experience proved the impotence of vaccination to prevent epidemics.

286. The case of Leicester, on which we have had a large amount of evidence, illustrates most clearly the origin and growth of local resistance to the law. It is proved that down to 1872 Leicester was, what is usually considered, a well-vaccinated town. During the years immediately preceding that date not more than 5 per cent. of the children born in each year were "unaccounted for." In other words, 95 per cent. were reported as satisfactorily vaccinated. In 1871, the year of the worst epidemic during the present century, the condition of Leicester was exceptionally good. Out of the whole 4,446 children born there in that year, only 15 were found to be neglected, and in every one of these 15 cases the parents were prosecuted. It appears, therefore, that there was very little, if any, opposition to the law in Leicester at that time, and public opinion in its favour seemed to be confirmed by experience; indeed the Medical Officer of Health of the borough, in his reports for the years 1869 and 1870, was able to state that vaccination had been "sedulously attended to," and he claimed the immunity of the town from small-pox as evidence of the effect of vaccination. While the epidemic in the country at large carried off 23,126 people in 1871, Leicester only lost 12. But in 1872 the town was not so fortunate. The deaths from small-pox suddenly rose to 346.

287. According to the evidence we have received, it was experience of this epidemic that fostered the rapid growth of opinion in Leicester adverse to vaccination. The ground taken was that vaccination had not protected either the population at large or the individuals vaccinated, and that therefore it ought no longer to be enforced. There were other reasons, such as the growth of a belief that the operation is injurious and sometimes fatal. But the origin of the movement was the disbelief in vaccination as a prophylactic. The election in 1887 of a board of guardians, of whom a majority were opposed to compulsion, led to the entire abandonment of prosecutions, and the law has since that time been locally in abeyance. Experience of a more recent outbreak in 1893-4 has not changed local opinion. On the contrary, it is alleged that the cessation of vaccination, together with the adoption of sanitary and isolation measures (to which we have referred in a former part of this report), have been much more



effective in saving life than was the enforcement of the law at the period of the previous epidemic.

288. The prevalence of this opinion is by no means confined to Leicester. In December 1891 we issued to all boards of guardians in England and Wales a number of questions concerning their mode of carrying out the law, the enforcement of which rests with them. The replies showed that in 122 unions compulsion had either been temporarily suspended until the report of the present Commission, or had been entirely abandoned, independently of our inquiry. These unions include, in addition to Leicester, a number of important towns, such as Reading, Falmouth, Derby, Darlington, Gateshead, South Shields, Colchester, Westham, Gloucester, Burnley, Bury, Oldham, Lancaster, Wigan, Wolverhampton, Ipswich, Eastbourne, Coventry, Hull, York, Middlesboro', Scarborough, Bradford, Dewsbury, Halifax, Keighley, and others.

289. The law is also in abeyance by resolution of the guardians, in the following Metropolitan Unions, viz., Camberwell, Hackney, Islington, Lambeth, Mile End, St. Olave's, St. Saviour's, and Shoreditch. Making allowance for the fact that in about 46 of the 122 unions the suspension of the compulsory law is professedly only temporary until this Commission shall have reported, we cannot regard without anxiety and fear the painful conflict that would be inevitable if an attempt were made to revive and re-enforce the compulsory law in these localities against the prevalent opinion of the inhabitants.

290. Indeed, even to make the attempt would be impossible without a considerable change in the law. For at present the duty of enforcement lies with the guardians, and it is made a test question in their election. If we could suppose that the evidence laid before us would have the effect of changing local opinion, we might count on the future election of guardians willing to carry out the law. But a large part of that evidence has been published already, and there is hitherto no appearance whatever of any change in the local opinion of the unions above mentioned, except in the rare cases in which epidemic has occasioned panic. Each year of our labours has witnessed not an increase, but a decrease in the numbers of guardians elected in these unions by the supporters of compulsion.

291. It appears, therefore, that, if the present law is to be made really effective, this can only be secured by imposing the duty of its enforcement on the police under the direction of inspectors of the Local Government Board. There is too much reason, however, to fear that even this would not be sufficient without a material increase in the severity of the law. The evidence received as to the prevalence and strength of conscientious objections on the part of parents convinces us that a considerable number could not be compelled by any penalties of fine or imprisonment to bring their children for vaccination or to allow the operation at their own homes. People who show this spirit are considered martyrs by their neighbours, and a few such cases soon create a local agitation against the law. The only way of enforcing the law without prosecution of parents would be to empower public vaccinators to seize children by the aid of the police and vaccinate them by force. But the attempt would probably create an agitation such as no Government could withstand. 6052-6764.

292. The difficulty of compulsion is greatly enhanced by the undeniable fact that vaccination is attended by an appreciable amount of danger. The constitution of a child is always more or less disturbed by it; and though the number of cases in which this disturbance assumes a painful or fatal form bears small proportion to the number of infants vaccinated, yet a certain amount of risk remains undeniable: and the question whether this risk should be encountered or not is naturally regarded as a matter of parental responsibility. We are unable to report that this risk is infinitesimal or unimportant.

293. The degree of risk which parental feeling may justly be compelled to encounter is scarcely susceptible of statistical statement. If we were in a position to affirm that there is absolutely no danger, our task might be much simplified. But when once the reality of appreciable danger is proved, as we hold it to be, it becomes a very delicate question how far the law is morally justified in interfering with the discretion of parents. It may be urged that a very great danger to the community might justify the enforcement of a proved and indispensable safeguard even at some risk to individuals. But the danger from small-pox to any community using such precautions as we have recommended is not now great enough, nor is the safeguard of sufficient certainty to fulfil these conditions.



294. It is true that in a considerable number of the cases examined for us the injury or death is reported to have been only indirectly due to vaccination. Insanitary surroundings and parental ignorance or even parental neglect are assigned in some cases as the causes of complications. But even in such cases it is clear that, apart from the vaccination, the contributory causes alone would not have produced the results admitted. An operation which for its safety requires complete sanitation, with care and skill on the part of every mother, would seem to be scarcely a fit matter for universal compulsion.

295. On this point we may quote the language of M. Depaul, for some time superintendent of the vaccination service in France, as reported and approved by the late M. Lefort, himself a strong advocate of vaccination but an opponent of compulsion. In his final reply on a long discussion in the Académie de Médecine, M. Lefort said : " A law to make vaccination compulsory seems to me vexatious, ineffective, and impracticable. I cannot put out of my mind the offensiveness of such a law to free men ; nor can I any more put out of my mind that the father of a family also has rights of which he can hardly be disposed to deprive himself in order to entrust them to the Government. Still, if we could—not indeed entirely suppress small-pox—but at least diminish it substantially by violating this liberty, I could even assent to this notwithstanding my repugnance ; but as it is not so I cannot assent to this compulsion." " Here, gentlemen, it is not I who speak, but it is M. Depaul, for long the director of our vaccine service, who uttered these words on this platform on March 20th, 1881." (Bulletin de l'Académie de Médecine, 3me série, Tom. xxv, No. 7, séance du 17 Février 1891, p. 270.)

296. On the whole, then, we are of opinion that a resolute and universal enforcement of vaccination is neither possible, nor expedient, nor just. It is not possible, because there exists a sufficient amount of conscientious opinion opposed to it to give recalcitrants the credit of martyrdom, and because in great centres, such as Leicester, it is questionable whether even the police could carry out compulsion without the aid of the army. It is inexpedient, because it concentrates attention on a safeguard proved to be insufficient in itself, and leads to the neglect of sanitation and isolation, which our evidence shows to be more effective. It is unjust, because to meet a danger often remote by a defence at best uncertain, it overrides parental responsibility and disregards parental feeling.

297. The proposal of our colleagues is, that, while abandoning the attempt to enforce vaccination upon those who honestly object to it, we should continue to press it by force of law upon the indifferent and negligent. In the matter of re-vaccination, however, their proposal is different ; they are impressed with the transient influence of vaccination, and recognise the need of re-vaccination as early as nine or ten years of age, and advise its repetition at intervals, but they do not suggest that the repeated operation, which they regard as essential, should be pressed upon the indifferent and negligent as in the case of the primary operation.

298. Now the whole principle of securing the protection of a community from small-pox by the artificial production of a mild disease (whether it be inoculation or vaccination) is based upon the thoroughness of the procedure in two directions:—1. In applying the inoculatory process to *every* individual ; and 2. In securing to each individual operated upon the maximum of protection the process is capable of securing.

299. The proposals of our colleagues appear to us to fail upon their own showing in both directions. They recognise the impossibility of securing the primary vaccination of every person, and open a means of escape for objectors. They are also not prepared to recommend that re-vaccination should be pressed in the same manner as the primary operation at a time when the vaccinated have lapsed into susceptibility to small-pox.

This serves to prove that any such system must at best be a broken reed on which to rely for the protection of a community from small-pox epidemics.

300. We believe the methods of isolation of the infected, disinfection, and the observance of strict cleanliness are both more successful and more legitimate methods for the State to encourage. They have the advantage of applying the preventive only where it is required ; and they do not necessitate an operation upon the person of every healthy individual.

301. We, therefore, recommend that the law be amended by the repeal of the compulsory clauses of the Vaccination Acts. But in consideration of the prevalent belief in the value of vaccination as a prophylactic for an indefinite period, we suggest that in other



respects the law should be left as it is, subject, however, to such modifications as are recommended for the diminution of attendant risks. The precedent established in the case of the abolition of compulsory church rates might be followed with advantage. In that case all machinery for laying and collecting the rate was left intact though the power of enforcement was taken away. The effect of our recommendation, if adopted, would be that vaccination would continue to be provided as at present for those who desire to avail themselves of it, but efforts to secure vaccination would be limited to moral influence—in a word, the whole country would be in the position of those unions in which the guardians have abandoned compulsion.

302. The grounds on which we object to the enforcement of vaccination by penalties necessarily lead us also to object to any method of indirect compulsion. We regard as both inexpedient and unjust exclusion from any branch of the public service because of the refusal to submit to vaccination or re-vaccination. The injustice is perhaps most severely felt in the case of candidates for employment as pupil-teachers in public elementary schools. There are now districts in which, owing to the general opposition to vaccination, scarcely a girl or boy can be found who is legally eligible, and candidates have to be brought in at great inconvenience from surrounding districts. The existence of an exceptional case or cases in which such rejected candidates have at some time afterwards taken small-pox is in our view no justification for the continuation of this grievance. Statistics furnished to the Commission prove that large numbers of vaccinated or re-vaccinated persons have taken the disease; and we are not aware of any evidence to show that vaccinated pupil-teachers have any special immunity. If our recommendations were carried out the danger of contagion would be greatly diminished, in schools, as elsewhere.

303. On the whole, then, while there is much in the report of our colleagues from which we dissent, and we have accordingly abstained with reluctance from adding our signatures to theirs, we are at one with them in holding that it is unwise to attempt to enforce vaccination on those who regard it as useless and dangerous. We, however, go further, and agree with our colleagues, Mr. Whitbread and Mr. Bright, that it would be simpler and more logical to abolish compulsory vaccination altogether.

W. J. COLLINS.

J. ALLANSON PICTON.

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